

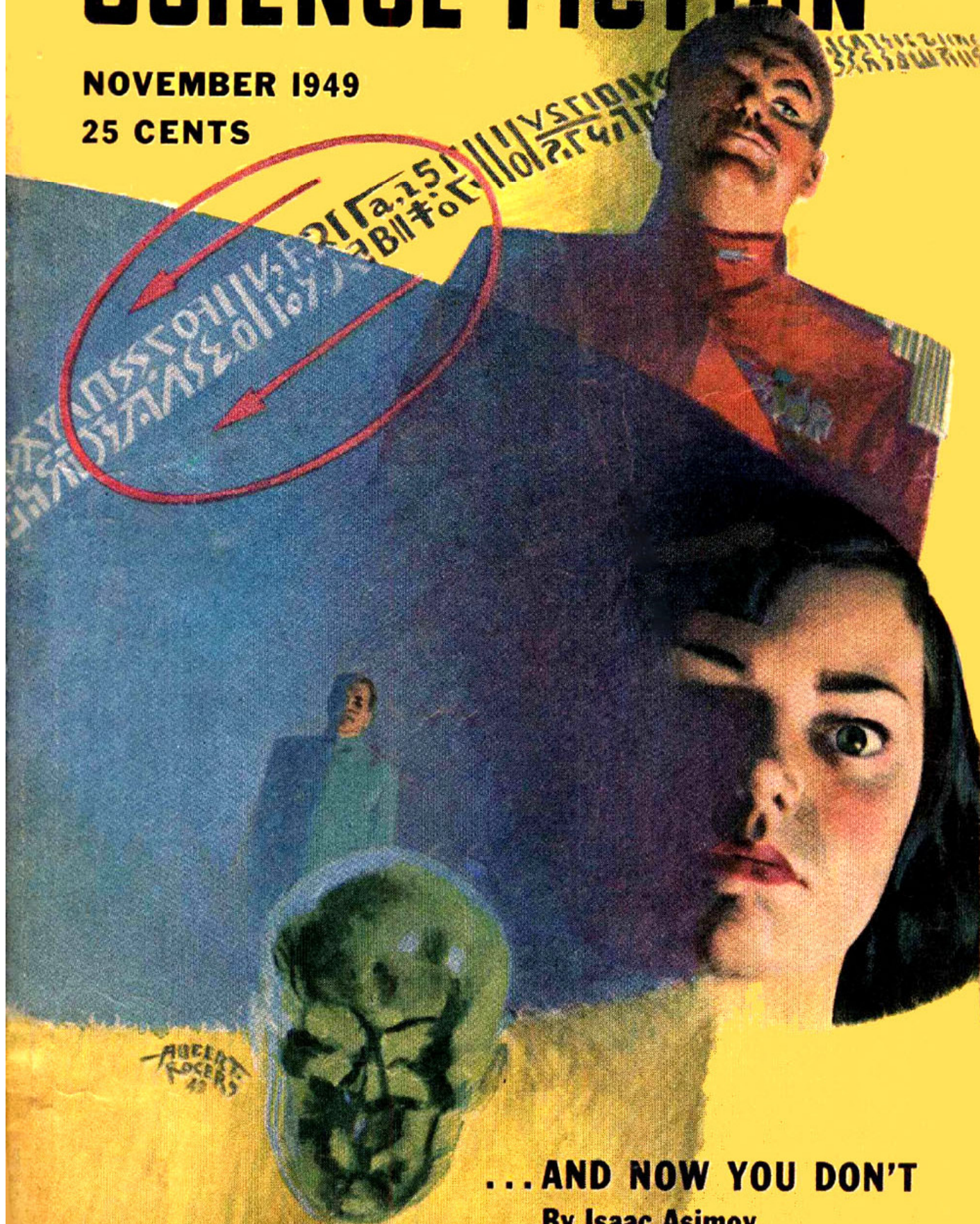
*Astounding*

# SCIENCE FICTION

REG. U. S. PAT. OFF.

NOVEMBER 1949

25 CENTS



...AND NOW YOU DON'T

By Isaac Asimov



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# SCIENCE-FICTION PROPHECY

That science-fiction can, and does prophesy engineering accomplishments is obvious to any science-fictioneer. Of course, the standard, and most easily understood method of accurate prophecy involves simply taking known laboratory data of today, expanding it from microscopic to macroscopic scale, and writing a story based on or involving the macroscopic application. This class is best represented by—at the moment—the atomic bomb.

Less known, at least to the non-science-fiction world, and in some ways more powerful methods exist. There is the method based on the realization that what enough people want badly enough, they will, sooner or later, force into actuality.

The old "if you wish for it long enough, wish for it strong enough, wishes do come true" applies as a correct and accurate statement of fact—when the "you" is interpreted as being very highly plural—from fifty to two thousand million people. The economics behind that is the simple fact that, if each of fifty million families is willing to pay two hundred dollars for a television set, there's a ten billion dollar market waiting.

The same sort of pressure is forcing the problem of reaching the planets. We haven't done it yet; we don't actually, as yet know a prac-

tical method. Chemical fuels can do it, but not very practically in the present state of the art. We haven't, yet, figured out a basic, workable method of applying nuclear energy to the problem.

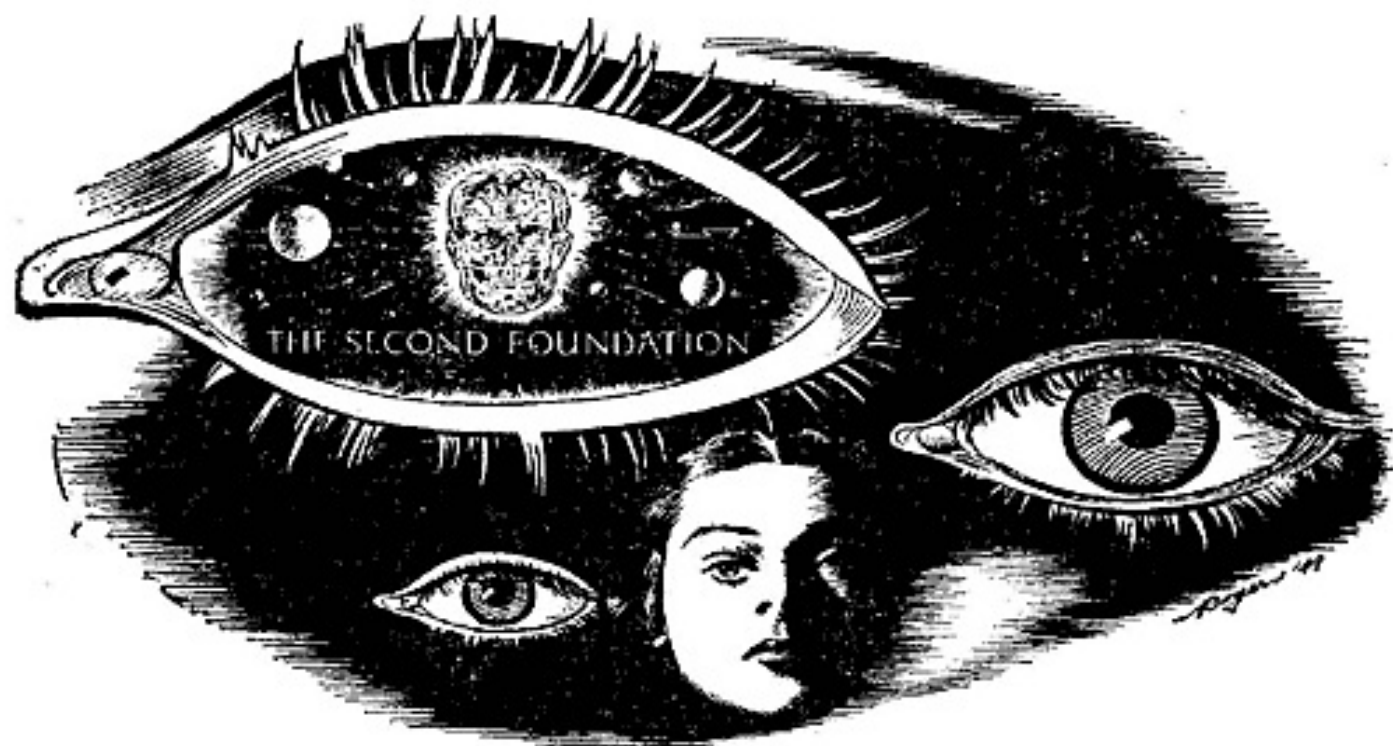
The final method of science-fiction prophecy is, in many ways, more interesting. Given the prophecy that men will reach the planets because they want to, the next prophecy-field is *how* they'll do it. Rockets became the accepted method, and science-fictioners started going into detail, designing the fittings of the rocketships, and refining the design. At first, for instance, the air supply came from compressed air tanks, then from mechanico-chemical air-purifiers, and finally growing plants became the standard technique.

This type of suggestion becomes prophecy because sound engineering ideas have been presented; the engineers assigned to actual rocketship development, having read the ideas naturally tend to consider them, try them, and use them. Generally, a desirable, practicably attainable idea, suggested in prophecy, has a chance of forcing itself into reality by its very existence.

Like, for example, this particular issue of *Astounding Science Fiction*.

The Editor.





# ...AND NOW YOU DON'T

BY ISAAC ASIMOV Part I

*It was an inevitable—but not quite inescapable conflict. The First Foundation HAD to find the Second Foundation; the Second Foundation HAD to prevent it—or die!*

Illustrated by Rogers

Arcadia Darell declaimed firmly into the mouthpiece of her transcriber:

"The Future of Seldon's Plan, by A. Darell"

and then thought darkly that some day when she was a great writer, she would write all her masterpieces under the pseudonym of Arkady. Just Arkady. No last name at all.

"A. Darell" would be just the sort

of thing that she would have to put on all her themes for her class in Composition and Rhetoric—so tasteless. All the other kids had to do it, too, except for Olynthus Dam, because the class laughed so when he did it the first time. And "Arcadia" was a little girl's name, wished on her because her great-grandmother had been called that; her parents just had no imagination at all.

...AND NOW YOU DON'T



Now that she was two days past fourteen, you'd think they'd recognize the simple fact of adulthood and call her Arkady. Her lips tightened as she thought of her father looking up from his book-viewer just long enough to say, "But if you're going to pretend you're nineteen, Arcadia, what will you do when you're twenty-five and all the boys think you're thirty?"

From where she sprawled across the arms and into the hollow of her own special armchair, she could see the mirror on her dresser. Her foot was a little in the way because her house slipper kept twirling about her big toe, so she pulled it in and sat up with an unnatural straightness to her neck that she felt sure, somehow, lengthened it a full two inches into slim regality.

For a moment, she considered her face thoughtfully—too fat. She opened her jaws half an inch behind closed lips, and caught the resultant trace of unnatural gauntness at every angle. She licked her lips with a quick touch of tongue and let them pout a bit in moist softness. Then she let her eyelids droop in a weary, worldly way— Oh, golly if only her cheeks weren't that silly *pink*.

She tried putting her fingers to the outer corners of her eye and tilting the lids a bit to get that mysterious exotic languor of the women of the inner star systems, but her hands were in the way and she couldn't see her face very well.

Then she lifted her chin, caught herself at a half-profile, and with her

eyes a little strained from looking out the corner and her neck muscles faintly aching, she said, in a voice one octave below its natural pitch: "Really, father, if you think it makes a *particle* of difference to me what some silly old *boys* think, you just—"

And then she remembered that she still had the transmitter open in her hand and said, drearily: "Oh, golly," and shut it off.

The faintly violet paper with the peach margin line on the left had upon it the following:

#### "THE FUTURE OF SELDON'S PLAN

"Really, father, if you think it makes a particle of difference to me what some silly old boys think, you just

"Oh, golly."

She pulled the sheet out of the machine with annoyance and another clicked neatly into place.

But her face smoothed out of its vexation, nevertheless, and her wide, little mouth stretched into a self-satisfied smile. She sniffed at the paper delicately. Just right. Just that proper touch of elegance and charm. And the penmanship was just the last word.

The machine had been delivered two days ago on her first adult birthday. She had said: "But father, everybody—just *everybody* in the class who has the slightest pretensions to *being* anybody has one. Nobody but some old drips would use hand machines—"

The salesman had said: "There is no other model as compact on the

one hand and as adaptable on the other. It will spell and punctuate correctly according to the sense of the sentence. Naturally, it is a great aid to education since it encourages the user to employ careful enunciation and breathing in order to make sure of the correct spelling, to say nothing of demanding a proper and elegant delivery for correct punctuation."

Even then her father had tried to get one geared for typeprint as if she were some dried-up, old-maid teacher.

But when it was delivered, it was the model she wanted—obtained perhaps with a little more wail and snuffle than quite went with the adulthood of fourteen—and copy was turned out in a charming and entirely feminine handwriting, with the most beautifully graceful capitals anyone ever saw.

Even the phrase, "Oh, golly," somehow breathed glamour when the Transcriber was done with it.

But just the same she had to get it right, so she sat up straight in her chair, placed her first draft before her in businesslike fashion, and began again, crisply and clearly; her abdomen flat, her chest lifted, and her breathing carefully controlled. She intoned, with dramatic fervor:

"The Future of Seldon's Plan.

"The Foundation's past history is, I am sure, well-known to all of us who have had the good fortune to be educated in our planet's efficient and well-staffed school system.

(There! That would start things off right with Miss Erlking, that mean old hag.)

That past history is largely the past history of the great Plan of Hari Seldon. The two are one. But the question in the mind of most people today is whether this Plan will continue in all its great wisdom, or whether it will be foully destroyed, or, perhaps, has been so destroyed already.

"To understand this, it may be best to pass quickly over some of the highlights of the Plan as it has been revealed to humanity thus far.

(This part was easy because she had taken Modern History the semester before.)

"In the days, nearly four centuries ago, when the First Galactic Empire was decaying into the paralysis that preceded final death, one man—the great Hari Seldon—foresaw the approaching end. Through the science of psychohistory, the intricacies of whose mathematics has long since been forgotten,

(She paused in a trifle of doubt. She was sure that "intricacies" was pronounced with soft *c*'s but the spelling didn't look right. Oh, well, the machine couldn't very well be wrong—)

he and the men who worked with him were able to foretell the course of the great social and economic currents sweeping the Galaxy at the time. It was possible for them to realize that, left to itself, the Empire would break up, and that thereafter there would be



at least thirty thousand years of anarchic chaos prior to the establishment of a new Empire.

"It was too late to prevent the great Fall, but it was still possible, at least, to cut short the intermediate period of chaos. The Plan was, therefore, evolved whereby only a single millennium would separate the Second Empire from the First. We are completing the fourth century of that millennium, and many generations of men have lived and died while the Plan has continued its inexorable workings.

"Hari Seldon established two Foundations at the opposite ends of the Galaxy, in a manner and under such circumstances as would yield the best mathematical solution for his psychohistorical problem. In one of these, *our* Foundation, established here on Terminus, there was concentrated the physical science of the Empire, and through the possession of that science, the Foundation was able to withstand the attacks of the barbarous kingdoms which had broken away and become independent, out at the fringe of the Empire.

"The Foundation, indeed, was able to conquer in its turn these short-lived kingdoms by means of the leadership of a series of wise and heroic men like Salvor Hardin and Hober Mallow who were able to interpret the Plan intelligently and to guide our land through its

(She had written "intricacies" here also, but decided not to risk it a second time.)

complica-

tions. All our planets still revere their memories although centuries have passed.

"Eventually, the Foundation established a commercial system which controlled a large portion of the Siwennian and Anacreonian sectors of the Galaxy, and even defeated the remnants of the old Empire under its last great general, Bel Riose. It seemed that nothing could now stop the workings of Seldon's plan. Every crisis that Seldon had planned had come at its appropriate time and had been solved, and with each solution the Foundation had taken another giant stride toward Second Empire and peace.

"And then,

(Her breath came short at this point, and she hissed the words between her teeth, but the Transmitter simply wrote them, calmly and gracefully.)

with the last remnants of the dead First Empire gone and with only ineffectual warlords ruling over the splinters and remnants of the decayed colossus,

(She got *that* phrase out of a thriller on the video last week, but old Miss Erlking never listened to anything but symphonies and lectures, so *she'd* never know.)

there

came the Mule.

"This strange man was not allowed for in the Plan. He was a mutant, whose birth could not have been predicted. He had the strange and mysterious power of controlling

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and manipulating human emotions and in this manner could bend all men to his will. With breath-taking swiftness, he became a conqueror and Empire-builder, until, finally, he even defeated the Foundation itself.

"Yet he never obtained universal dominion, since in his first overpowering lunge he was stopped by the wisdom and daring of a great woman

(Now there was that old problem again. Father *would* insist that she never bring up the fact that she was the grandchild of Bayta Darell. Everyone knew it and Bayta was just about the greatest woman there ever was and she *had* stopped the Mule singlehanded.)

in a manner the true story of which is known in its entirety to very few.

(There! If she had to read it to the class, that last could be said in a dark voice, and someone would be sure to ask what the true story was, and then—well, and then she couldn't *help* tell the truth if they asked her, could she? In her mind, she was already wordlessly whizzing through a hurt and eloquent explanation to a stern and questioning paternal parent.)

"After five years of restricted rule, another change took place, the reasons for which are not known, and the Mule abandoned all plans for further conquest. His last five years were those of an enlightened despot.

"It is said by some that the change in the Mule was brought about by

the intervention of the Second Foundation. However, no man has ever discovered the exact location of this other Foundation, nor knows its exact function, so that theory remains unproven.

"A whole generation has passed since the death of the Mule. What of the future, then, now that he has come and gone? He interrupted Seldon's Plan and seemed to have burst it to fragments, yet as soon as he died, the Foundation rose again, like a nova from the dead ashes of a dying star.

(She had made that up herself.)

Once again, the planet Terminus houses the center of a commercial federation almost as great and as rich as before the conquest, and even more peaceful and democratic.

"Is this planned? Is Seldon's great dream still alive, and will a Second Galactic Empire yet be formed six hundred years from now? I, myself, believe so, because

(This was the important part. Miss Erlking always had those large, ugly red-pencil scrawls that went: 'But this is only descriptive. What are your personal reactions? Think! Express yourself! Penetrate your own soul!' Penetrate your own soul. A lot *she* knew about souls, with her lemon face that never smiled in its life—)

never at any time has the political situation been so favorable. The old Empire is completely dead and the period of the Mule's rule put an end to the era of warlords that preceded



him. Most of the surrounding portions of the Galaxy are civilized and peaceful.

"Moreover the internal health of the Foundation is better than ever before. The despotic times of the pre-Conquest hereditary mayors have given way to the democratic elections of early times. There are no longer dissident worlds of independent Traders; no longer the injustices and dislocations that accompanied accumulations of great wealth in the hands of a few.

"There is no reason, therefore, to fear failure, unless it is true that the Second Foundation itself presents a danger. Those who think so have no evidence to back their claim, but merely vague fears and superstitions. I think that our confidence in ourselves, in our nation, and in Hari Seldon's great Plan should drive from our hearts and minds all uncertainties and

(Hm-m-m. This was awfully corny, but something like this was expected at the end.)

so I say—"

That is as far as "The Future of Seldon's Plan" got, at that moment\*,

—  
\*If a more formal and slightly longer version of the history of the Foundation is desired, than is given in Arcadia's theme—without the necessity of wading through the formidable and definitive "Essays on History," by Ligurn Vier—reference may be made to the following stories appearing in earlier issues of this magazine:

"Foundation"—May, 1942

"Bridle and Saddle"—June, 1942

"The Big and the Little"—August, 1944

"The Wedge"—October, 1944

"Dead Hand"—April, 1945

"The Mule"—November, December, 1945

"Now You See It"—January, 1948

because there was the gentlest little tap on the window, and when Arcadia shot up to a balance on one arm of the chair, she found herself confronted by a smiling face beyond the glass, its even symmetry of feature interestingly accentuated by the short, vertical line of a finger before its lips.

With the slight pause necessary to assume an attitude of bewilderment, Arcadia dismounted from the armchair, walked to the couch that fronted the wide window that held the apparition and, kneeling upon it, stared out thoughtfully.

The smile upon the man's face faded quickly. While the fingers of one hand tightened whitely upon the sill, the other made a quick gesture. Arcadia obeyed calmly, and closed the latch that moved the lower third of the window smoothly into its socket in the wall, allowing the warm spring air to interfere with the conditioning within.

"You can't get in," she said, with comfortable smugness. "The windows are all screened, and keyed only to people who belong here. If you come in, all sorts of alarms will break loose." A pause, then she added, "You look sort of silly balancing on that ledge underneath the window. If you're not careful, you'll fall and break your neck and a lot of valuable flowers."

"In that case," said the man at the window, who had been thinking that very thing—with a slightly different arrangement of adjectives— "will

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you shut off the screen and let me in?"

"No use in doing that," said Arcadia. "You're probably thinking of a different house, because I'm not the kind of girl who lets strange men into their . . . her bedroom this time of night." Her eyes, as she said it, took on a heavy-lidded sultriness—or an unreasonable facsimile thereof.

All traces of humor whatever had disappeared from the young stranger's face. He muttered, "This is Dr. Darell's house, isn't it?"

"Why should I tell you?"

"Oh, Galaxy— Good-by—"

"If you jump off, young man, I will personally give the alarm." (This was intended as a refined and sophisticated thrust of irony, since to Arcadia's enlightened eyes the intruder was an obviously mature thirty, at least—quite elderly, in fact.)

Quite a pause. Then, tightly, he said: "Well, now, look here, girly, if you don't want me to stay, and don't want me to go, what *do* you want me to do."

"You can come in, I suppose. Dr. Darell *does* live here. I'll shut off the screen now."

Warily, after a searching look, the young man poked his hand through the window, then hunched himself up and through it. He brushed at his knees with an angry, slapping gesture, and lifted a reddened face at her.

"You're quite sure that your character and reputation won't suffer

when they find me here, are you?"

"Not as much as yours would, because just as soon as I hear footsteps outside, I'll just shout and yell and say you forced your way in here."

"Yes?" he replied with heavy courtesy, "And how do you intend to explain the shut-off protective screen?"

"Poof! That would be easy. There wasn't any there in the first place."

The man's eyes were wide with chagrin, "That was a bluff? How old are you, kid?"

"I consider that a very impertinent question, young man. And I am not accustomed to being addressed as 'kid.'"

"I don't wonder. You're probably the Mule's grandmother in disguise. Do you mind if I leave now before you arrange a lynching party with myself as star performer?"

"You had better not leave—because my father's expecting you."

The man's look became a wary one, again. An eyebrow shot up as he said, lightly, "Oh? Anyone with your father?"

"No."

"Anyone called on him lately?"

"Only tradespeople—and you."

"Anything unusual happen at all?"

"Only you."

"Forget me, will you? No, don't forget me. Tell me, how did you know your father was expecting me?"

"Oh, that was easy. Last week,



he received a Personal Capsule, keyed to him personally, with a self-oxidizing message, you know. He threw the capsule shell into the Trash Disinto, and yesterday, he gave Poli—that's our maid, you see—a month's vacation so she could visit her sister in Terminus City, and this afternoon, he made up the bed in the spare room. So I knew he expected somebody that I wasn't supposed to know anything about. Usually, he tells me everything."

"Really! I'm surprised he has to. I should think you'd know everything before he tells you."

"I usually do." Then she laughed. She was beginning to feel very much at ease. The visitor was elderly, but very distinguished-looking with curly brown hair and very blue eyes. Maybe she could meet somebody like that again, sometimes, when she was old herself.

"And just how," he asked, "did you know it was *I* he expected."

"Well, who else *could* it be? He was expecting somebody in so secrecy a way, if you know what I mean—and then you come gumping around trying to sneak through windows, instead of walking through the front door, the way you would if you had any sense." She remembered a favorite line, and used it promptly, "Men are so stupid!"

"Pretty stuck on yourself, aren't you, kid? I mean, Miss. You could be wrong, you know. What if I told you that all this is a mystery to me and that as far as I know, your

father is expecting someone else, not me."

"Oh, I don't think so. I didn't ask you to come in, until after I saw you drop your briefcase."

"My what?"

"Your briefcase, young man. I'm not blind. You didn't drop it by accident, because you looked down *first*, so as to make sure it would land right. Then you must have realized it would land just under the hedges and wouldn't be seen, so you dropped it and *didn't* look down afterwards. Now since you came to the window instead of the front door, it must mean that you were a little afraid to trust yourself in the house before investigating the place. And after you had a little trouble with me, you took care of your briefcase before taking care of yourself, which means that you consider whatever your briefcase has in it to be more valuable than your own safety, and *that* means that as long as you're in here and the briefcase is out there and we know that it's out there, you're probably pretty helpless."

She paused for a much-needed breath, and the man said, grittily, "Except that I think I'll choke you just about medium dead and get out of here, *with* the briefcase."

"Except, young man, that I happen to have a baseball bat under my bed, which I can reach in two seconds from where I'm sitting, and I'm very strong for a girl."

Impasse. Finally, with a strained courtesy, the "young man" said:

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"Shall I introduce myself, since we're being so chummy. I'm Pelleas Anthor. And your name?"

"I'm Arca— Arkady Darell. Pleased to meet you."

"And now Arkady, would you be a good little girl and call your father?"

Arcadia bridled, "I'm not a little girl. I think you're very rude—especially when you're asking a favor."

Pelleas Anthor sighed, "Very well. Would you be a good, kind, dear, little old lady, just chock full of lavender, and call your father?"

"That's not what I meant either, but I'll call him. Only not so I'll take my eyes off *you*, young man." And she stamped on the floor.

There came the sound of hurry-

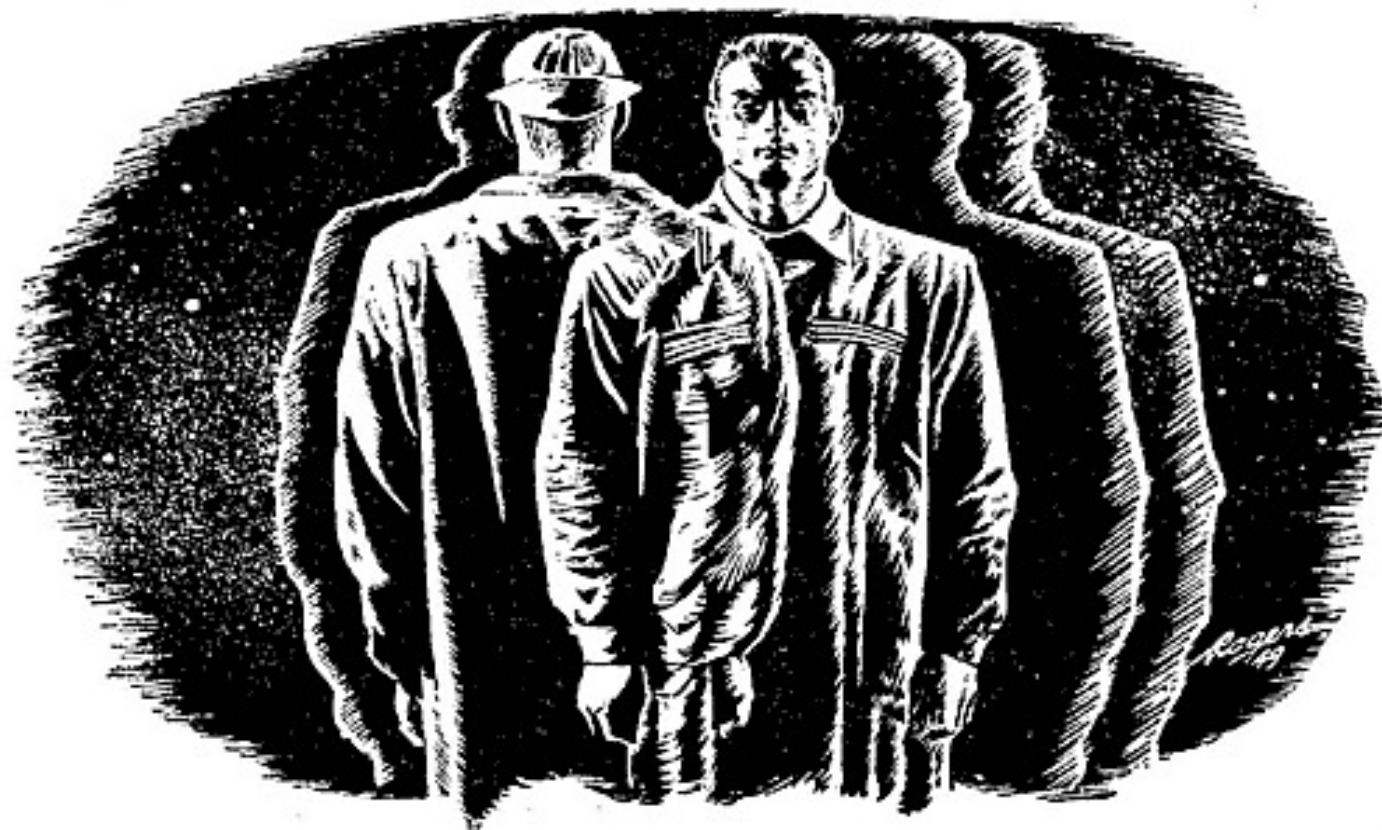
ing footsteps in the hall, and the door was flung open.

"Arcadia—" There was a tiny explosion of exhaled air, and Dr. Darell said, "Who are you, sir?"

Pelleas sprang to his feet in what was quite obviously relief, "Dr. Toran Darell? I am Pelleas Anthor. You've received word about me, I think. At least, your daughter says you have."

"My *daughter* says I have?" He bent a frowning glance at her which caromed harmlessly off the wide-eyed and impenetrable web of innocence with which she met the accusation.

Dr. Darell said, finally: "I *have* been expecting you. Would you mind coming down with me, please?" And he stopped as his eye caught a



... AND NOW YOU DON'T



flicker of motion, which Arcadia caught simultaneously.

She scrambled toward her Transcriber, but it was quite useless, since her father was standing right next to it. He said, sweetly: "You've left it going all this time, Arcadia."

"Father," she squeaked, in real anguish, "it is very ungentlemanly to read another person's private correspondence, especially when it's talking correspondence."

"Ah," said her father, "but 'talking correspondence' with a strange man in your bedroom! As a father, Arcadia, I must protect you against evil."

"Oh, golly—it was nothing like *that*."

Pelleas laughed suddenly, "Oh, but it was, Dr. Darell. The young lady was going to accuse me of all sorts of things, and I must insist that you read it, if only to clear *my* name."

"Oh—" Arcadia held back her tears with an effort. Her own father didn't even trust her. And that darned Transcriber— If that silly fool hadn't come gooping at the window, and making her forget to turn it off. And now her father would be making long, gentle speeches about what young ladies aren't supposed to do. There just wasn't anything they *were* supposed to do, it looked like, except choke and die, maybe.

"Arcadia," said her father, gently, "it strikes me that a young lady—"

She knew it. She knew it.

"—should not be quite so impertinent to men older than she is."

"Well, what did he want to come peeping around my window for? A young lady has a right to privacy— Now I'll have to do my whole darned composition over."

"It's not up to you to question his propriety in coming to your window. You should simply not have let him in. You should have called me instantly—especially if you thought I was expecting him."

She said, peevishly: "It's just as well if you didn't see him—stupid thing. He'll give the whole thing away if he keeps on going to windows, instead of doors."

"Arcadia, nobody wants your opinion on matters you know nothing of."

"I do, too. It's the Second Foundation, that's what it is."

There was a silence. Even Arcadia felt a little nervous stirring in her abdomen.

Dr. Darell said, softly: "Where have you heard this?"

"Nowheres, but what else is there to be so secret about. And you don't have to worry that I'll tell anyone."

"Mr. Anthor," said Dr. Darell, "I must apologize for all this."

"Oh, that's all right," came Anthor's rather hollow response. "It's not your fault if she's sold herself to the forces of darkness. But do you mind if I ask her a question before we go. Miss Arcadia—"

"What do you want?"

"Why do you think it is stupid to

go to windows instead of to doors?"

"Because you advertise what you're trying to hide, silly. If I have a secret, I don't put tape over my mouth and let everyone *know* I have a secret. I talk just as much as usual, only about something else. Didn't you ever read any of the sayings of Salvor Hardin? He was our first Mayor, you know."

"Yes, I know."

"Well, he used to say that only a lie that wasn't ashamed of itself could possibly succeed. He also said that nothing had to *be* true, but everything had to *sound* true. Well, when you come in through a window, it's a lie that's ashamed of itself and it doesn't sound true."

"Then what would you have done?"

"If I had wanted to see my father on top secret business, I would have made his acquaintance openly and seen him about all sorts of strictly legitimate things. And then when everyone knew all about you and connected you with my father as a matter of course, you could be as top secret as you want and nobody would ever think of questioning it."

Author looked at the girl strangely, then at Dr. Darell. He said: "Let's go. I have a briefcase I want to pick up in the garden. Wait! Just one last question. Arcadia, you don't really have a baseball bat under your bed, do you?"

"No! I don't."

"Hah. I didn't think so."

Dr. Darell stopped at the door. "Arcadia," he said, "when you re-

... AND NOW YOU DON'T

write your composition on the Seldon Plan, don't be unnecessarily mysterious about your grandmother. There is no necessity to mention that part at all."

He and Peileas descended the stairs in silence. Then the visitor asked in a strained voice, "Do you mind, sir? How old is she?"

"Fourteen, day before yesterday."

"*Fourteen?* Great Galaxy— Tell me, has she ever said she expects to marry some day?"

"No, she hasn't. Not to me."

"Well, if she ever does, shoot him. The one she's going to marry, I mean." He stared earnestly into the older man's eyes. "I'm serious. Life could hold no greater horror than living with what she'll be like when she's twenty. I don't mean to offend you, of course."

"You don't offend me. I think I know what you mean."

Upstairs, the object of their tender analyses faced the Transcriber with revolted weariness and said, dully: "The future of seldonsplan." The Transcriber with infinite aplomb, translated that into elegantly, complicated script capitals as: "The Future of Seldon's Plan."

## II.

Consider a room!

The location of the room is not in question at the moment. It is merely sufficient to say that in that room, more than anywhere, the Second Foundation existed.

It was a room which, through the centuries, had been the abode of pure science—yet it had none of the gadgets with which, through millennia of association, science has come to be considered equivalent. It was a science, instead, which dealt with mathematical concepts only, in a manner similar to the speculation of ancient, ancient races in the primitive, prehistoric days before technology had come to be; before Man had spread beyond a single, now-unknown world.

For one thing, there was in that room—protected by a mental science as yet unassailable by the combined physical might of the rest of the Galaxy—the Prime Radiant, which held in its vitals the Seldon Plan—complete.

For another, there was a man, too, in that room— The First Speaker.

He was the twelfth in the line of chief guardians of the Plan, and his title bore no deeper significance than the fact that at the gatherings of the leaders of the Second Foundation, he spoke first.

His predecessor had beaten the Mule, but the wreckage of that gigantic struggle still littered the path of the Plan— For twenty-five years, he, and his administration, had been trying to force a Galaxy of stubborn and stupid human beings back to the path— It was a terrible task.

The First Speaker looked up at the opening door. Even while, in the loneliness of the room, he considered his quarter century of effort, which now so slowly and inevitably

approached its climax; even while he had been so engaged, his mind had been considering the newcomer with a gentle expectation. A youth, a student, one of those who might take over, eventually.

The young man stood uncertainly at the door, so that the First Speaker had to walk to him and lead him in, with a friendly hand upon the shoulder.

The Student smiled shyly, and the First Speaker responded by saying: "First, I must tell you why you are here."

They faced each other now, across the desk. Neither was speaking in any way that could be recognized as such by any man in the Galaxy who was not himself a member of the Second Foundation.

Speech, originally, was the device whereby Man learned, imperfectly, to transmit the thoughts and emotions of his mind. By setting up arbitrary sounds and combinations of sounds to represent certain mental nuances, he developed a method of communication—but one which in its clumsiness and thick-thumbed inadequacy degenerated all the delicacy of the mind into gross and guttural signaling.

Down—down—the results can be followed; and all the suffering that humanity ever knew can be traced to the one fact that no man in the history of the Galaxy, until Hari Seldon, and very few men thereafter, could really understand one another. Every human being lived behind an



impenetrable wall of choking mist within which no other but he existed. Occasionally there were the dim signals from deep within the cavern in which another man was located—so that each might grope toward the other. Yet because they did not know one another, and could not understand one another, and dared not trust one another, and felt from infancy the terrors and insecurity of that ultimate isolation—there was the hunted fear of man for man, the savage rapacity of man toward man.

Feet, for tens of thousands of years, had clogged and shuffled in the mud—and held down the minds which, for an equal time, had been fit for the companionship of the stars.

Grimly, Man had instinctively sought to circumvent the prison bars of ordinary speech. Semantics, symbolic logic, psychoanalysis—they had all been devices whereby speech could either be refined or by-passed.

Psychohistory had been the development of mental science, the final mathematicization thereof, rather, which had finally succeeded. Through the development of the mathematics necessary to understand the facts of neural physiology and the electrochemistry of the nervous system, which themselves had to be, *had* to be, traced down to nuclear forces, it first became possible to truly develop psychology. And through the generalization of psychological knowledge from the individual to the group, sociology was also mathematicized.

The larger groups; the billions that occupied planets; the trillions that occupied Sectors; the quadrillions that occupied the whole Galaxy, became, not simply human beings, but gigantic forces amenable to statistical treatment—so that to Hari Seldon, the future became clear and inevitable, and the Plan could be set up.

The same basic developments of mental science that had brought about the development of the Seldon Plan, thus made it also unnecessary for the First Speaker to use words in addressing the Student.

Every reaction to a stimulus, however slight, was completely indicative of all the trifling changes, of all the flickering currents that went on in another's mind. The First Speaker could not sense the emotional content of the Student's instinctively, as the Mule would have been able to do—since the Mule was a mutant with powers not ever likely to become completely comprehensible to any ordinary man, even a Second Foundationer—rather he deduced them, as the result of intensive training.

Since, however, it is inherently impossible in a society based on speech to indicate truly the method of communication of Second Foundationers among themselves, the whole matter will be hereafter ignored. The First Speaker will be represented as speaking in ordinary fashion, and if the translation is not always entirely valid, it is at least

the best that can be done under the circumstances.

It will be pretended therefore, that the First Speaker *did* actually say, "First, I must tell you why you are here," instead of smiling *just* so and lifting a finger *exactly* thus.

The First Speaker said: "You have studied mental science hard and well for most of your life. You have absorbed all your teachers could give you. It is time for you and a few others like yourself to begin your apprenticeship for Speakerhood."

Agitation from the other side of the desk.

"No—now you must take this phlegmatically. You had hoped you would qualify. You had feared you would not. Actually, both hope and fear are weaknesses. You *knew* you would qualify and you hesitate to admit the fact because such knowledge might stamp you as cocksure and therefore unfit. Nonsense! The most hopelessly stupid man is he who is not aware that he is wise. It is part of your qualification that you *knew* you would qualify."

Relaxation on the other side of the desk.

"Exactly. Now you feel better and your guard is down. You are fitter to concentrate and fitter to understand. Remember, to be truly effective, it is not necessary to hold the mind under a tight, controlling barrier which to the intelligent probe is as informative as a naked mentality. Rather, one should cultivate an innocence, an awareness of self, and an unself-consciousness of

self which leaves one nothing to hide. My mind is open to you. Let this be so for both of us."

He went on. "It is not an easy thing to be a Speaker. It is not an easy thing to be a Psychohistorian in the first place; and not even the best Psychohistorian need necessarily qualify to be a Speaker. There is a distinction here. A Speaker must not only be aware of the mathematical intricacies of the Seldon Plan; he must have a sympathy for it and for its ends. He must *love* the Plan; to him it must be life and breath. More than that, it must even be as a living friend.

"Do you know what this is?"

The First Speaker's hand hovered gently over the black, shining cube in the middle of the desk. It was featureless.

"No, Speaker, I do not."

"You have heard of the Prime Radiant?"

"This?" —Astonishment.

"You expected something more noble and awe-inspiring? Well, that is natural. It was created in the days of the Empire, by men of Seldon's time. For nearly four hundred years, it has served our needs perfectly, without requiring repairs or adjustment. And fortunately so, since none of the Second Foundation is qualified to handle it in any technical fashion." He smiled gently. "Those of the First Foundation might be able to duplicate this, but they must never know, of course."

He depressed a lever on his side of the desk and the room was in

darkness. But only for a moment, since with a gradually livening flush, the two long walls of the room glowed to life. First, a pearly white, unrelieved, then a trace of faint darkness here and there, and finally, the fine neatly printed equations in black, with an occasional red hair-line that wavered through the darker forest like a staggering rillet.

"Come, my boy, step here before the wall. You will not cast a shadow. This light does not radiate from the Radiant in an ordinary manner. To tell you the truth, I do not know even faintly by what medium this effect is produced, but you will not cast a shadow. I know that."

They stood together in the light. Each wall was thirty feet long, and ten high. The writing was small and covered every inch.

"This is not the whole Plan," said the First Speaker. "To get it all upon both walls, the individual equations would have to be reduced to microscopic size—but that is not necessary. What you now see represents the main portions of the Plan till now. You have learned about this, have you not?"

"Yes, Speaker, I have."

"Do you recognize any portion?"

A slow silence. The Student pointed a finger and as he did so, the line of equations marched down the wall, until the single series of functions he had thought of—one could scarcely consider the quick, generalized gesture of the finger to

have been sufficiently precise—was at eye-level.

The First Speaker laughed softly, "You will find the Prime Radiant to be attuned to your mind. You may expect more surprises from the little gadget. What were you about to say about the equation you have chosen?"

"It," faltered the Student, "is a Rigellian integral, using a planetary distribution of a bias indicating the presence of two chief economic classes on the planet, or maybe a Sector, plus an unstable emotional pattern."

"And what does it signify?"

"It represents the limit of tension, since we have here"—he pointed, and again the equations veered—"a converging series."

"Good," said the First Speaker. "And tell me, what do you think of all this. A finished work of art, is it not?"

"Definitely!"

"Wrong! It is not." This, with sharpness. "It is the first lesson you must unlearn. The Seldon Plan is neither complete nor correct. Instead, it is merely the best that could be done at the time. Over a dozen generations of men have pored over these equations, worked at them, taken them apart to the last decimal place, and put them together again. They've done more than that. They've watched nearly four hundred years pass and against the predictions and equations, they've checked reality, and they have learned.



"They have learned more than Seldon ever knew, and if with the accumulated knowledge of the centuries we could repeat Seldon's work, we could do a better job. Is that perfectly clear to you?"

The Student appeared a little shocked.

"Before you obtain your Speakerhood," continued the First Speaker, "you yourself will have to make an original contribution to the Plan. It is not such great blasphemy. Every red mark you see on the wall is the contribution of a man among us who lived since Seldon. Why . . . why—" He looked upward, "There!"

The whole wall seemed to whirl down upon him.

"This," he said, "is mine." A fine red line encircled two forking arrows and included six square feet of deductions along each path. Between the two were a series of equations in red.

"It does not," said the Speaker, "seem to be much. It is at a point in the Plan which we will not reach yet for a time as long as that which has already passed. It is at the period of coalescence, when the Second Empire that is to be is in the grip of rival personalities who will threaten to pull it apart if the fight is too even, or clamp it into rigidity, if the fight is too uneven. Both possibilities are considered here, followed, and the method of avoiding either indicated.

"Yet it is all a matter of probabilities and a third course can exist. It is one of comparatively low likeli-

hood—twelve point six four percent, to be exact—but even smaller chances have *already* come to pass and the Plan is only forty percent complete. This third probability consists of a possible compromise between two or more of the conflicting personalities being considered. This, I showed, would first freeze the Second Empire into an unprofitable mold, and then, eventually, inflict more damage through civil wars than would have taken place had a compromise never been made in the first place. Fortunately, that could be prevented, too. And that was my contribution."

"If I may interrupt, Speaker—How is a change made?"

"Through the agency of the Radiant. You will find in your own case, for instance, that your mathematics will be checked rigorously by five different boards; and that you will be required to defend it against a concerted and merciless attack. Two years will then pass, and your development will be reviewed again. It has happened more than once that a seemingly perfect piece of work has uncovered its fallacies only after an induction period of months or years. Sometimes, the contributor himself discovers the flaw.

"If, after two years, another examination, not less detailed than the first, still passes it, and—better still—if in the interim the young scientist has brought to light additional details, subsidiary evidence, the contribution will be added to the Plan.

ASTOUNDING SCIENCE-FICTION

It was the climax of my career; it will be the climax of yours.

"The Prime Radiant can be adjusted to your mind, and all corrections and additions can be made through mental rapport. There will be nothing to indicate that the correction or addition is yours. In all the history of the Plan there has been no personalization. It is rather a creation of all of us together. Do you understand?"

"Yes, Speaker!"

"Then, enough of that." A stride to the Prime Radiant, and the walls were blank again save for the ordinary room-lighting region along the upper borders. "Sit down here at my desk, and let me talk to you. It is enough for a Psychohistorian, as such, to know his Biostatistics and his Neurochemical Electromathematics. Some know nothing else and are fit only to be statistical technicians. But a Speaker must be able to discuss the Plan without mathematics. If not the Plan itself, at least its philosophy and its aims.

"First of all, what is the aim of the Plan? Please tell me in your own words—and don't grope for fine sentiment. You won't be judged on polish and suavity, I assure you."

It was the Student's first chance at more than a bisyllable, and he hesitated before plunging into the expectant space cleared away for him. He said, diffidently: "As a result of what I have learned, I believe that it is the intention of the Plan to establish a human civilization based on an orientation entirely

different from anything that ever before existed. An orientation which, according to the findings of Psychohistory, could never *spontaneously* come into being—"

"Stop!" The First Speaker was insistent. "You must not say 'never.' That is a lazy slurring over of the facts. Actually, Psychohistory predicts only probabilities. A particular event may be infinitesimally probable, but the probability is always greater than zero."

"Yes, Speaker. The orientation desired, if I may correct myself, then, is well known to possess no significant probability of spontaneously coming to pass."

"Better. What is the orientation?"

"It is that of a civilization based on mental science. In all the known history of Mankind, advances have been made primarily in physical technology: in the capacity of handling the inanimate world about Man. Control of self and society has been left to chance or to the vague gropings of intuitive ethical systems based on inspiration and emotion. As a result, no culture of greater stability than about fifty-five percent has ever existed, and these only as the result of great human misery."

"And why is the orientation we speak of a nonspontaneous one?"

"Because a large minority of human beings are mentally equipped to take part in the advance of physical science, and all receive the crude and visible benefits thereof. Only an in-

significant minority, however, are inherently able to lead Man through the greater involvements of Mental Science; and the benefits derived therefrom, while longer lasting, are more subtle and less apparent. Furthermore, since such an orientation would lead to the development of a benevolent dictatorship of the mentally best—virtually a higher subdivision of Man—it would be resisted and could not be stable without the application of a force which would depress the rest of Mankind to brute level. Such a development is repugnant to us and must be avoided.”

“What, then, is the solution?”

“The solution is the Seldon Plan. Conditions have been so arranged and so maintained that in a millennium from its beginnings—six hundred years from now, a Second Galactic Empire will have been established in which Mankind will be ready for the leadership of Mental Science. In that same interval, the Second Foundation in *its* development, will have brought forth a group of Psychologists ready to assume leadership. Or, as I have myself often thought, the First Foundation supplies the physical framework of a single political unit, and the Second Foundation supplies the mental framework of a ready-made ruling class.”

“I see. Fairly adequate. Do you think that *any* Second Empire, even if formed in the time set by Seldon, would do as a fulfillment of his Plan?”

“No, Speaker, I do not. There are several possible Second Empires that may be formed in the period of time stretching from nine hundred to seventeen hundred years after the inception of the Plan, but only one of these is *the* Second Empire.”

“And in view of all this, why is it necessary that the existence of the Second Foundation be hidden—above all, from the First Foundation?”

The Student probed for a hidden meaning to the question and failed to find it. He was troubled in his answer, “For the same reason that the details of the Plan as a whole must be hidden from Mankind in general. The laws of Psychohistory are statistical in nature and are rendered invalid if the actions of individual men are not random in nature. If a sizable group of human beings learned of key details of the Plan, their actions would be governed by that knowledge and would no longer be random in the meaning of the axioms of Psychohistory. In other words, they would no longer be perfectly predictable. Your pardon, Speaker, but I feel that the answer is not satisfactory.”

“It is well that you do. Your answer is quite incomplete. It is the Second Foundation itself which must be hidden, not simply the Plan. The Second Empire is not yet formed. We have still a society which would resent a ruling class of psychologists, and which would fear



its development and fight against it. Do you understand that?"

"Yes, Speaker, I do. The point has never been stressed—"

"Don't minimize. It has never been made—in the classroom, though you should be capable of deducing it yourself. This and many other points we will make now and in the near future during your apprenticeship. You will see me again in a week. By that time, I would like to have comments from you as to a certain problem which I now set before you. I don't want complete and rigorous mathematical treatment. That would take a year for an expert, and not a week for you. But I do want an indication as to trends and directions—"

"You have here a fork in the Plan at a period in time of about half a century ago. The necessary details are included. You will note that the path followed by the assumed reality diverges from all the plotted predictions; its probability being under one percent. You will estimate for how long the divergence may continue before it becomes uncorrectable. Estimate also the probable end if uncorrected, and a reasonable method of correction."

The Student flipped the Viewer at random and looked stonily at the passages presented on the tiny, built-in screen.

He said: "Why this particular problem, Speaker? It obviously has significance other than purely academic."

"Thank you, my boy. You are as

quick as I had expected. The problem is not supposititious. Nearly half a century ago, the Mule burst into Galactic history and for ten years was the largest single fact in the universe. He was unprovided for; uncalculated for. He bent the Plan seriously, but not fatally.

"To stop him before he *did* become fatal, however, we were forced to take active part against him. We revealed our existence, and infinitely worse, a portion of our power. The First Foundation has learned of us, and their actions are now predicated on that knowledge. Observe in the problem presented. Here. And here.

"Naturally, you will not speak of this to anyone."

There was an appalled pause, as realization seeped into the Student. He said: "Then the Seldon Plan has failed!"

"Not yet. It merely *may* have failed. The probabilities of success are *still* twenty-one point four percent, as of the last assessment."

### III.

For Dr. Darell and Pelleas Anthon, the evenings passed in friendly intercourse; the days in pleasant unimportance. It might have been an ordinary visit. Dr. Darell introduced the young man as a cousin from across space, and interest was dulled by the cliché.

Somehow, however, among the small talk, a name might be mentioned. There would be an easy



thoughtfulness. Dr. Darell might say, "No," or he might say, "Yes." A call on the open Communi-wave issued a casual invitation, "Want you to meet my cousin."

And Arcadia's preparations proceeded in their own manner. In fact, her actions might be considered the least straightforward of all.

For instance, she induced Olynthus Dam at school to donate to her a home-built, self-contained sound-receiver by methods which indicated a future for her that promised peril to all males with whom she might come into contact. To avoid details, she merely exhibited such an interest in Olynthus' self-publicized hobby—he had a home workshop—combined with such a well-modulated transfer of this interest to Olynthus' own pudgy features, that

the unfortunate youth found himself: 1) discoursing at great and animated length upon the principles of the hyper-wave motor; 2) becoming dizzyingly aware of the great, absorbed eyes that rested so lightly upon his; and 3) forcing into her willing hands his own greatest creation, the afore-said sound-receiver.

Arcadia cultivated Olynthus in diminishing degree thereafter for just long enough to remove all suspicion that the sound-receiver had been the cause of the friendship. For months afterwards, Olynthus felt the memory of that short period in his life over and over again with the tendrils of his mind; until finally, for lack of further addition, he gave up and let it slip away.

When the seventh evening came, and five men sat in the Darell living room with food within and tobacco without, Arcadia's desk upstairs was occupied by this quite unrecognizable home-product of Olynthus' ingenuity.

Five men then. Dr. Darell, of course, with graying hair and meticulous clothing, looking somewhat older than his forty-two years. Pelleas Anthor, serious and quick-eyed at the moment, looking young and unsure of himself. And the three new men: Jole Turbor, visicaster, bulky and plump-lipped; Dr. Elvett Semic, professor-emeritus of physics at the University, scrawny and wrinkled, his clothes only half-filled; Homir Munn, librarian, lanky and terribly ill-at-ease.

Dr. Darell spoke easily, in a normal, matter-of-fact tone: "This gathering has been arranged, gentlemen, for a trifle more than merely social reasons. You may have guessed this. Since you have been deliberately chosen because of your backgrounds, you may also guess the danger involved. I won't minimize it, but I will point out that we are all condemned men, in any case.

"You will notice that none of you have been invited with any attempt at secrecy. None of you have been asked to come here unseen. The windows are not adjusted to non-insight. No screen of any sort is about the room. We have only to attract the attention of the enemy to be ruined; and the best way to attract that attention is to assume a false and theatrical secrecy.

(*Hah*, thought Arcadia, bending over the voices coming—a bit screechily—out of the little box.)

"Do you understand that?"

Elvett Semic twitched his lower lip and bared his teeth in the screw-up, wrinkled gesture that preceded his every sentence: "Oh, get on with it. Tell us about the youngster."

Dr. Darell said: "Pelleas Anthor is his name. He was a student of my old colleague, Kleise, who died last year. Kleise sent me his brain-pattern to the fifth sublevel, before he died, which pattern has been now checked against that of the man before you. You know, of course, that a brain-pattern cannot be duplicated that far, even by men of the Science of Psychology. If you don't know

that, you'll have to take my word for it."

Turbor said, pure-lipped: "We might as well make a beginning somewhere. We'll take your word for it, especially since you're the greatest electroneurologist in the Galaxy now that Kleise is dead. At least, that is the way I've described you in my visicast comment, and I even believe it myself. How old are you, Anthor?"

"Twenty-nine, Mr. Turbor."

"Hm-m-m. And are you an electroneurologist, too? A great one?"

"Just a student of the science. But I work hard, and I've had the benefit of Kleise's training."

Munn broke in. He had a slight stammer at periods of tension, "I . . . I wish you'd g . . . get started. I think everyone's t . . . talking too much."

Dr. Darell lifted an eyebrow in Munn's direction, "You're right, Homir. Take over, Pelleas."

"Not for a while," said Pelleas Anthor, slowly, "because before we can get started—although I appreciate Mr. Munn's sentiment—I must request brain-wave data."

Darell frowned: "What is this, Anthor? What brain-wave data do you refer to?"

"The patterns of all of you. You have taken mine, Dr. Darell. I must take yours and those of the rest of you. And I must take the measurements myself."

Turbor said: "There's no reason for him to trust us, Darell. The young man is within his rights."



"Thank you," said Anthor. "If you'll lead the way to your laboratory then, Dr. Darell, we'll proceed. I took the liberty this morning of checking your apparatus."

The science of encephalography was at once new and old. It was old in the sense that the knowledge of the microcurrents generated by nerve cells of living beings belonged to that immense category of human knowledge whose origin was completely lost. It was knowledge that stretched back as far as the earliest remnants of human history—

And yet it was new, too. The fact of the existence of microcurrents slumbered through the tens of thousands of years of Galactic Empire as one of those vivid and whimsical, but quite useless, items of human knowledge. Some had attempted to form classifications of waves into waking and sleeping, calm and excited, well and ill—but even the broadest conceptions had had their hordes of vitiating exceptions.

Others had tried to show the existence of brain-wave groups, analogous to the well-known blood groups, and to show that external environment was the defining factor. These were the race-minded people who claimed that Man could be divided into subspecies. But such a philosophy could make no headway against the overwhelming ecumenical drive involved in the fact of Galactic Empire—one political unit covering twenty million stellar systems, involving all of Man from the

central world of Trantor—now a gorgeous and impossible memory of the great past—to the loneliest asteroid on the periphery.

And then again, in a society given over, as that of the First Empire was, to the physical sciences and inanimate technology, there was a vague but mighty sociological *push* away from the study of the mind. It was less respectable because less immediately useful; and it was poorly financed since it was less profitable.

After the disintegration of the First Empire, there came the fragmentation of organized science, back, back—past even the fundamentals of atomic power into the chemical power of coal and oil. The one exception to this, of course, was the First Foundation where the spark of science, revitalized and grown more intense was maintained and fed to flame. Yet there, too, it was the physical that ruled, and the brain, except for surgery, was neglected ground.

Hari Seldon was the first to express what afterwards came to be accepted as truth.

"Neural micro-currents," he once said, "carry within them the spark of every varying impulse and response, conscious and unconscious. The brain-waves recorded on neatly squared paper in trembling peaks and troughs are the mirrors of the combined thought-pulses of billions of cells. Theoretically, analysis should reveal the thoughts and emotions of the subject, to the last and

least. Differences should be detected that are due not only to gross physical defects, inherited or acquired, but also to shifting states of emotion, to advancing education and experience, even to something as subtle as a change in the subject's philosophy of life."

But even Seldon could approach no further than speculation.

And now for fifty years, the men of the First Foundation had been tearing at that incredibly vast and complicated storehouse of new knowledge. The approach, naturally, was made through new techniques—as, for example, the use of electrodes at skull sutures by a newly-developed means which enabled contact to be made directly with the gray cells, without even the necessity of shaving a patch of skull. And then there was a recording device which automatically recorded the brain-wave data as an overall total, and as separate functions of six independent variables.

What was most significant, perhaps, was the growing respect in which encephalography and the encephalographer was held. Kleise, the greatest of them, sat at scientific conventions on an equal basis with the physicist. Dr. Darell, though no longer active in the science, was known for his brilliant advances in encephalographic analysis almost as much as for the fact that he was the son of Bayta Darell, the great heroine of the past generation.

And so now, Dr. Darell sat in his

own chair, with the delicate touch of the feathery electrodes scarcely hinting at pressure upon his skull, while the vacuum-incased needles wavered to and fro. His back was to the recorder—otherwise, as was well known, the sight of the moving curves induced an unconscious effort to control them, with noticeable results—but he knew that the central dial was expressing the strongly rhythmic and little-varying Sigma curve, which was to be expected of his own powerful and disciplined mind. It would be strengthened and purified in the subsidiary dial dealing with the Cerebellar wave. There would be the sharp, near-discontinuous leaps from the frontal lobe, and the subdued shakiness from the sub-surface regions with its narrow range of frequencies—

He knew his own brain-wave pattern much as an artist might be perfectly aware of the color of his eyes.

Pelleas Anthor made no comment when Darell rose from the reclining chair. The young man abstracted the seven recordings, glanced at them with the quick, all-embracing eyes of one who knows exactly what tiny facet of near-nothingness is being looked for.

"If you don't mind, Dr. Semic."

Semic's age-yellowed face was serious. Encephalography was a science of his old age of which he knew little; an upstart that he faintly resented. He knew that he was old and that his wave-pattern would show it. The wrinkles on his face showed it, the stoop in his walk, the

shaking of his hand—but *they* spoke only of his body. The brain-wave patterns might show that his mind was old, too. An embarrassing and unwarranted invasion of a man's last protecting stronghold, his own mind.

The electrodes were adjusted. The process did not hurt, of course, from beginning to end. There was just that tiny tingle, far below the threshold of sensation.

And then came Turbor, who sat quietly and unemotionally through the fifteen minute process, and Munn, who jerked at the first touch of the electrodes and then spent the session rolling his eyes as though he wished he could turn them backwards and watch through a hole in his occiput.

"And now—" said Darell, when all was done.

"And now," said Anthor, apologetically, "there is one more person in the house."

Darell, frowning, said: "My daughter?"

"Yes. I suggested that she stay home tonight, if you'll remember."

"For encephalographical analysis? What in the Galaxy for?"

"I cannot proceed without it."

Darell shrugged and climbed the stairs. Arcadia, amply warned, had the sound-receiver off when he entered; then followed him down with mild obedience. It was the first time in her life—except for the taking of her basic mind pattern as an infant, for identification and registration purposes—that she found herself under the electrodes.

"May I see," she asked, when it was over, holding out her hand.

Dr. Darell said: "You would not understand, Arcadia. Isn't it time for you to go to bed?"

"Yes, father," she said, demurely. "Good night, all."

She ran up the stairs and plumped into bed with a minimum of basic preparation. With Olynthus' sound-receiver propped beside her pillow, she felt like a character out of a book-film, and hugged every moment of it close to her chest in an ecstasy of "spy-stuff."

The first words she heard were Anthor's and they were: "The analyses, gentlemen, are all satisfactory. The child's as well."

Child, she thought disgustedly, and bristled at Anthor in the darkness.

Anthor had opened his briefcase now, and out of it, he took several dozen brain-wave records. They were not originals. Nor had the briefcase been fitted with an ordinary lock. Had the key been held in any hand other than his own, the contents thereof would have silently and instantly oxidized to an indecipherable ash. Once removed from the briefcase, the records did so anyway after half an hour.

But during their short lifetime, Anthor spoke quickly: "I have the records here of several minor government officials at Anacreon. This is a psychologist at Locris University; this an industrialist at Siwenna. The rest are as you see."



They crowded closely. To all but Darell, they were so many quivers on parchment. To Darell, they shouted with a million tongues.

Author pointed lightly, "I call your attention, Dr. Darell, to the plateau region among the secondary Tauian waves in the frontal lobe, which is what all these records have in common. Would you use my Analytical Rule, sir, to check my statement?"

The Analytical Rule might be considered a distant relation—as a skyscraper is to a shack—of that kindergarten toy, the logarithmic Slide Rule. Darell used it with the wrist-flip of long practice. He made free-hand drawings of the result and, as Author stated, there were featureless plateaus in frontal lobe regions where strong swings should have been expected.

"How would you interpret that, Dr. Darell?" asked Author.

"I'm not sure. Offhand, I don't see how it's possible. Even in cases of amnesia, there is suppression, but not removal. Drastic brain surgery, perhaps?"

"Oh, something's been cut out," cried Author, impatiently, "yes! Not in the physical sense, however. You know, the Mule could have done just that. He could have suppressed completely all capacity for a certain emotion or attitude of mind, and leave nothing but just such a flatness. Or else—"

"Or else the Second Foundation could have done it. Is that it?" asked Turbor, with a slow smile.

There was no real need to answer that thoroughly rhetorical question.

"What made you suspicious, Mr. Author?" asked Munn.

"It wasn't I. It was Dr. Kleise. He collected brain-wave patterns, much as the Planetary Police do, but along different lines. He specialized in intellectuals, government officials and business leaders. You see, it's quite obvious that if the Second Foundation is directing the historical course of the Galaxy—of us—that they must do it subtly and in as minimal a fashion as possible. If they work through minds, as they must, it is the minds of people with influence; culturally, industrially, or politically. And with those he concerned himself.

"Yes," objected Munn, "but is there corroboration? How do these people act—I mean the ones with the plateau. Maybe it's all a perfectly normal phenomenon." He looked hopelessly at the others out of his, somehow, childlike blue eyes, but met no encouraging return.

"I leave that to Dr. Darell," said Author. "Ask him how many times he's seen this phenomenon in his general studies, or in reported cases in the literature over the past generation. Then ask him the chances of it being discovered in almost one out of every thousand cases among the categories Dr. Kleise studied."

"I suppose that there is no doubt," said Darell, thoughtfully, "that these are artificial mentalities. They have been tampered with. In a way, I have suspected this—"

"I know that, Dr. Darell," said Anthon. "I also know you once worked with Dr. Kleise. I would like to know why you stopped."

There wasn't actually hostility in his question. Perhaps nothing more than caution; but, at any rate, it resulted in a long pause. Darell looked from one to another of his guests, then said brusquely, "Because there was no point to Kleise's battle. He was competing with an adversary too strong for him. He was detecting what we—he and I—knew he would detect—that we were not our own masters. *And I didn't want to know!* I had my self-respect. I liked to think that our Foundation was captain of its collective soul; that our forefathers had not quite fought and died for nothing. I thought it would be most simple to turn my face away as long as I was not quite sure. I didn't need my position since the Government pension awarded to my mother's family in perpetuity would take care of my uncomplicated needs. My home laboratory would suffice to keep boredom away, and life would some day end— Then Kleise died—"

Semic showed his teeth and said: "This fellow Kleise; I don't know him. How did he die?"

Anthon cut in: "He *died*. He thought he would. He told me half a year before that he was getting too close—"

"Now *we're* too c . . . close, too, aren't we?" suggested Munn, dry-

mouthed, as his Adam's apple jiggled.

"Yes," said Anthon, flatly, "but we were, anyway—all of us. It's why you've all been chosen. I'm Kleise's student. Dr. Darell was his colleague. Jole Turbor has been denouncing our blind faith in the saving hand of the Second Foundation on the air, until the government shut him off—through the agency, I might mention, of a powerful financier whose brain shows what Kleise used to call the Tamper Plateau. Homir Munn has the largest home collection of Muliana—if I may use the phrase to signify collected data concerning the Mule—in existence, and has published some papers containing speculation on the nature and function of the Second Foundation. Dr. Semic has contributed as much as anyone to the mathematics of encephalographic analysis, though I don't believe he realized that his mathematics could be so applied."

Semic opened his eyes wide and chuckled gaspingly, "No, young fellow. I was analyzing intranuclear motions—the n-body problem, you know. I'm lost in encephalography."

"Then we know where we stand. The government can, of course, do nothing about the matter. Whether the mayor or anyone in his administration is aware of the seriousness of the situation, I don't know. But this I do know—we five have nothing to lose and stand to gain much. With every increase in our knowledge, we can widen ourselves in safe

ASTOUNDING SCIENCE-FICTION

directions. We are but a beginning, you understand."

"How widespread," put in Turbor, "is this Second Foundation infiltration?"

"I don't know. There's a flat answer. All the infiltrations we have discovered were on the outer fringes of the nation. The capital world may yet be clean, though even that is not certain—else I would not have tested you. You were particularly suspicious, Dr. Darell, since you abandoned research with Kleise. Kleise never forgave you, you know. I thought that perhaps the Second Foundation had corrupted you, but Kleise always insisted that you were a coward. You'll forgive me, Dr. Darell, if I explain this to make my own position clear. I, personally, think I understand your attitude, and, if it was cowardice, I consider it venial."

Darell drew a breath before replying, "I ran away! Call it what you wish. I tried to maintain our friendship, however, yet he never wrote nor called me until the day he sent me your brain-wave data, and that was scarcely a week before he died—"

"If you don't mind," interrupted Homir Munn, with a flash of nervous eloquence, "I d . . . don't see what you think you're doing. We're a p . . . poor bunch of conspirators, if we're just going to talk and talk and t . . . talk. And I don't see what else we can do, anyway. This is v . . . very childish. B . . . brain-

... AND NOW YOU DON'T

waves and mumbo jumbo and all that. Is there just one thing you intend to *do*?"

Pelleas Anthor's eyes were bright, "Yes, there is. We need more information on the Second Foundation. It's the prime necessity. The Mule spent the first five years of his rule in just that quest for information and failed—or so we have all been led to believe. But then he stopped looking. Why? Because he failed? Or because he succeeded?"

"M . . . more talk," said Munn, bitterly. "How are we ever to know?"

"If you'll listen to me— The Mule's capital was on Kalgan. Kalgan was not part of the Foundation's commercial sphere of influence before the Mule and it is not part of it now. Kalgan is ruled, at the moment, by the man, Stettin, unless there's another palace revolution by tomorrow. Stettin calls himself **F**irst Citizen and considers himself the successor of the Mule. If there is any tradition in that world, it rests with the super-humanity and greatness of the Mule—a tradition almost superstitious in intensity. As a result, the Mule's old palace is maintained as a shrine. No unauthorized person may enter; nothing within has ever been touched."

"Well?"

"Well, why is that so? At times like these, nothing happens without a reason. What if it is not superstition only that makes the Mule's palace inviolate? What if the Sec-



ond Foundation has so arranged matters? In short what if the results of the Mule's five-year search are within—"

"Oh, p . . . poppycock."

"Why not?" demanded Anthor. "Throughout its history the Second Foundation has hidden itself and interfered in Galactic affairs in minimal fashion only. I know that to us it would seem more logical to destroy the Palace or, at the least, to remove the data. But you must consider the psychology of these master psychologists. They are Seldons; they are Mules and they work by indirection, through the mind. They would never destroy or remove when they could achieve their ends by creating a state of mind. Eh?"

No immediate answer, and Anthor continued, "And you, Munn, are just the one to get the information we need."

"I?" It was an astounded yell. Munn looked from one to the other rapidly, "I can't do such a thing. I'm no man of action; no hero of any teleview. I'm a librarian. If I can help you that way, all right, and I'll risk the Second Foundation, but I'm not going out into space on any qu . . . quixotic thing like that."

"Now, look," said Anthor, patiently, "Dr. Darell and I have both agreed that you're the man. It's the only way to do it naturally. You say you're a librarian. Fine! What is your main field of interest? *Muliana*! You already have the greatest collection of material on the Mule in the Galaxy. It is natural for you

to want more; more natural for you than for anyone else. *You* could request entrance to the Kalgan Palace without arousing suspicion of ulterior motives. You might be refused but you would not be suspected. What's more, you have a one-man cruiser. You're known to have visited foreign planets during your annual vacation. You've even been on Kalgan before. Don't you understand that you need only act as you always have?"

"But I can't just say, 'W . . . won't you kindly let me in to your most sacred shrine, M . . . Mr. First Citizen?'"

"Why not?"

"Because, by the Galaxy, he won't let me!"

"All right, then. So he won't. Then you'll come home and we'll think of something else."

Munn looked about in helpless rebellion. He felt himself being talked into something he hated. No one offered to help him extricate himself.

So in the end two decisions were made in Dr. Darell's house. The first was a reluctant one of agreement on the part of Munn to take off into space as soon as his summer vacation began.

The other was a highly unauthorized decision on the part of a thoroughly unofficial member of the gathering, made as she clicked off a sound-receiver and composed herself for a belated sleep. This second decision does not concern us just yet.

#### IV.

A week had passed on the Second Foundation, and the First Speaker was smiling once again upon the Student.

"You must have brought me interesting results, or you would not be so filled with anger."

The Student put his hand upon the sheaf of calculating paper he had brought with him and said: "Are you sure that the problem is a factual one?"

"The premises are true. I have distorted nothing."

"Then I *must* accept the results, and I do not want to."

"Naturally. But what have your wants to do with it? Well, tell me what disturbs you so. No, no, put your derivations to one side. I will subject them to analysis afterward. Meanwhile, *talk* to me. Let me judge your understanding."

"Well, then, Speaker— It becomes very apparent that a gross overall change in the basic psychology of the First Foundation has taken place. As long as they knew of the existence of a Seldon Plan, without knowing any of the details thereof, they were confident but uncertain. They knew they would succeed, but they didn't know when or how. There was, therefore, a continuous atmosphere of tension and strain—which was what Seldon desired. The First Foundation, in other words, could be counted upon to work at maximum potential."

"A doubtful metaphor," said the

First Speaker, "but I understand you."

"But now, Speaker, they know of the existence of a Second Foundation in what amounts to detail, rather merely than as an ancient and vague statement of Seldon's. They have an inkling as to its function as the guardian of the Plan. They know that an agency exists which watches their every step and will not let them fall. So they abandon their purposeful stride and allow themselves to be carried upon a litter. Another metaphor, I'm afraid."

"Nevertheless, go on."

"And that very abandonment of effort; that growing inertia; that lapse into softness and into a decadent and hedonistic culture, means the ruin of the Plan. They *must* be self-propelled."

"Is that all?"

"No, there is more. The majority reaction is as described. But a great probability exists for a minority reaction. Knowledge of our guardianship and our control will rouse among a few, not complacency, but hostility. This follows from Korilov's Theorem—"

"Yes, yes. I know the theorem."

"I'm sorry, Speaker. It is difficult to avoid mathematics. In any case, the effect is that not only is the Foundation's effort diluted, but part of it is turned against us, actively against us."

"And is *that* all?"

"There remains one other factor of which the probability is moderately low—"

"Very good. What is that?"

"While the energies of the First Foundation were directed only to Empire; while their only enemies were huge and outmoded hulks that remained from the shambles of the past, they were obviously concerned only with the physical sciences. With *us* forming a new, large part of their environment, a change in view may well be imposed on them. They may try to become psychologists—"

"That change," said the First Speaker, coolly, "*has* already taken place."

The Student's lips compressed themselves into a pale line: "Then all is over. It is the basic incompatibility with the Plan. Speaker, would I have known of this if I had lived—outside?"

The First Speaker spoke seriously, "You feel humiliated, my young man, because, thinking you understood so much so well, you suddenly find that many very apparent things were unknown to you. Thinking you were one of the Lords of the Galaxy; you suddenly find that you stand near to destruction. Naturally, you will resent the ivory tower in which you lived; the seclusion in which you were educated; the theories on which you were reared.

"I once had that feeling. It is normal. Yet it was necessary that in your formative years you have no direct contact with the Galaxy; that

you remain *here*, where all knowledge is filtered to you, and your mind carefully sharpened. We could have shown you this . . . this part-failure of the Plan earlier and spared you the shock now, but you would not have understood the significance properly, as you now will. Then you find no solution at all to the problem?"

The Student shook his head and said hopelessly: "None!"

"Well, it is not surprising. Listen to me, young man. A course of action exists and has been followed for over a decade. It is not a usual course, but one that we have been forced into against our will. It involves low probabilities, dangerous assumptions— We have even been forced to deal with individual reactions at times, because that was the only possible way, and you know that Psychostatistics by its very nature has no meaning when applied to less than planetary numbers."

"Are we succeeding?" gasped the Student.

"There's no way of telling yet. We have kept the situation stable so far—but for the first time in the history of the Plan, it is possible for the unexpected actions of a single individual to destroy it. We have adjusted a minimum number of outsiders to a needful state of mind; we have our agents—but their paths are planned. They dare not improvise. That should be obvious to you. And I will not conceal the





worst—if we are discovered, here, on this world, it will not only be the Plan that is destroyed, but ourselves, our physical selves. So you see, our solution is not very good.”

“But the little you have described does not sound like a solution at all, but like a desperate guess.”

“No. Let us say, an intelligent guess.”

“When is the crisis, Speaker? When will we know whether we have succeeded or not?”

“Well within the year, no doubt.”

The Student considered that, then nodded his head. He shook hands with the Speaker, “Well, it’s good to know.”

He turned on his heel and left.

The First Speaker looked out silently as the window gained transparency. Past the giant structures to the quiet, crowding stars.

A year would pass quickly. Would any of them, any of Seldon’s heritage, be alive at its end?

## V.

It was a little over a month before the summer could be said to have started. Started, that is, to the extent that Homir Munn had written his final financial report of the fiscal year, seen to it that the substitute librarian supplied by the Government was sufficiently aware of the subtleties of the post—last year’s man had been quite unsatisfactory—and arranged to have his little cruiser the *Unimara*—named after a tender and mysterious episode of twenty years past—taken out of its winter cobwebbery.

He left Terminus in a sullen distemper. No one was at the port to see him off. That would not have been natural since no one ever had in the past. He knew very well that it was important to have this trip in no way different from any he had made in the past, yet he felt drenched in a vague resentment. He, Homir

Munn, was risking his neck in der-ring-doery of the most outrageous sort, and yet he left alone.

At least, so he thought.

And it was because he thought wrongly, that the following day was one of confusion, both on the *Unimara* and in Dr. Darell's suburban home.

It hit Dr. Darell's home first, in point of time, through the medium of Poli, the maid, whose month's vacation was now quite a thing of the past. She flew down the stairs in a flurry and stutter.

The good doctor met her and she tried vainly to put emotion into words but ended by thrusting a sheet of paper and a cubical object at him.

He took them unwillingly and said: "What's wrong, Poli?"

"She's *gone*, doctor."

"Who's gone?"

"Arcadia!"

"What do you mean, gone? Gone where? What are you talking about?"

And she stamped her foot: "I don't know. She's gone, and there's a suitcase and some clothes gone with her and there's that letter. Why don't you read it, instead of just standing there? Oh, you *men*!"

Dr. Darell shrugged and opened the envelope. The letter was not long, and except for the angular signature, "Arkady," was in the ornate and flowing handwriting of Arcadia's transcriber.

Dear Father:

It would have been simply too heart-breaking to say good-by to you in person. I might have cried like a little girl and you would have been ashamed of me. So I'm writing a letter instead to tell you how much I'll miss you, even while I'm having this perfectly wonderful summer vacation with Uncle Homir. I'll take good care of myself and it won't be long before I'm home again. Meanwhile, I'm leaving you something that's all my own. You can have it now.

Your loving daughter,

Arkady.

He read it through several times with an expression that grew blanker each time. He said stiffly: "Have you read this, Poli?"

Poli was instantly on the defensive: "I certainly can't be blamed for that, doctor. The envelope has 'Poli' written on the outside, and I had no way of telling there was a letter for you on the inside. I'm no snoop, doctor, and in the years I've been with—"

Darell held up a placating hand, "Very well, Poli. It's not important. I just wanted to make sure you understood what had happened."

He was considering rapidly. It was no use telling her to forget the matter. With regard to the enemy, "forget" was a meaningless word; and the advice, insofar as it made the matter more important, would have had an opposite effect.

He said instead: "She's a queer little girl, you know. Very romantic. Ever since we arranged to have her go off on a space trip this summer, she's been quite excited."

"And just why has no one told *me* about this space trip?"

"It was arranged while you were away, and we forgot. It's nothing more complicated than that."

Poli's original emotions now concentrated themselves into a single, overwhelming indignation, "Simple, is it? The poor chick has gone off with one suitcase, without a decent stitch of clothes to her, and alone at that. How long will she be away?"

"Now I won't have you worrying about it, Poli. There will be plenty of clothes for her on the ship. It's been all arranged. Will you tell Mr. Anthor that I want to see him? Oh, and first—is this the object that Arcadia has left for me?" He turned it over in his hand.

Poli tossed her head, "I'm sure I don't know. The letter was on top of it and that's every bit I can tell you. Forget to tell me, indeed. If her mother were alive—"

Darell waved her away: "Please call Mr. Anthor."

Anthor's viewpoint on the matter differed radically from that of Arcadia's father. He punctuated his initial remarks with clenched fists and torn hair, and from there, passed on to bitterness.

"Great Space, what are you waiting for? What are we both waiting for? Get the spaceport on the viewer and have them contact the *Unimara*."

"Softly, Pelleas, she's *my* daughter."

"But it's not your Galaxy."

"Now, wait. She's an intelligent girl, Pelleas, and she's thought this thing out carefully. We had better follow her thoughts while this thing is fresh. Do you know what this thing is?"

"No. Why should it matter what it is?"

"Because it's a sound-receiver."

"That thing?"

"It's homemade, but it will work. I've tested it. Don't you see? It's her way of telling us that she's been a party to our conversations of policy. She knows where Homir Munn is going and why. She's decided it would be exciting to go along."

"Oh, Great Space," groaned the younger man. "Another mind for the Second Foundation to pick."

"Except that there's no reason why the Second Foundation should, *a priori*, suspect a fourteen-year-old girl of being a danger—*unless* we do anything to attract attention to her, such as calling back a ship out of space for no reason other than to take her off. Do you forget with whom we're dealing? How narrow the margin it is that separates us from discovery? How helpless we are thereafter?"

"But we can't have everything depend on an insane child."

"She's not insane, and we have no choice. She need not have written the letter, but she did it to keep us from going to the police after a lost child. Her letter suggests that we



convert the entire matter into a friendly offer on the part of Munn to take an old friend's daughter off for a short vacation. And why not? He's been my friend for nearly twenty years. He's known her since she was three, when I brought her back from Trantor. It's a perfectly natural thing, and, in fact, ought to decrease suspicion. A spy does not carry a fourteen-year-old niece about with him."

"So. And what will Munn do when he finds her?"

Dr. Darell heaved his eyebrows once, "I can't say—but I presume she'll handle him."

But the house was somehow very lonely at night and Dr. Darell found that the fate of the Galaxy made remarkably little difference while his daughter's mad little life was in danger.

The excitement on the *Unimara*, if involving fewer people, was considerably more intense.

In the luggage compartment, Arcadia found herself, in the first place, aided by experience, and in the second, hampered by the reverse.

Thus, she met the initial acceleration with equanimity and the more subtle nausea that accompanied the inside-outness of the first jump through hyperspace with stoicism. Both had been experienced on space hops before, and she was tensed for them. She knew also that luggage compartments were included in the ship's ventilation-system and that

they could even be bathed in wall-light. This last, however, she excluded as being too unconscionably unromantic. She remained in the dark, as a conspirator should, breathing very softly, and listening to the little miscellany of noises that surrounded Homir Munn.

They were undistinguished noises, the kind made by a man alone. The shuffling of shoes, the rustle of fabric against metal, the souging of an upholstered chair seat retreating under weight, the sharp click of a control unit, or the soft slap of a palm over a photoelectric cell.

Yet, eventually, it was the lack of experience that caught up with Arcadia. In the book films and on the videos, the stowaway seemed to have such an infinite capacity for obscurity. Of course, there was always the danger of dislodging something which would fall with a crash, or of sneezing—in videos you were almost sure to sneeze; it was an accepted matter. She knew all this, and was careful. There was also the realization that thirst and hunger might be encountered. For this, she was prepared with ration cans out of the pantry. But yet things remained that the films never mentioned, and it dawned upon Arcadia with a shock that, despite the best intentions in the world, she could stay hidden in the closet for only a limited time.

And on a one-man sports-cruiser, such as the *Unimara*, living space consisted, essentially, of a single room, so that there wasn't even the

risky possibility of sneaking out of the compartment while Munn was engaged elsewhere.

She waited frantically for the sounds of sleep to arise. If only she knew whether he snored. At least she knew where the bunk was and she could recognize the rolling protest of one when she heard it. There was a long breath and then a yawn. She waited through a gathering silence, punctuated by the bunk's soft protest against a changed position or a shifted leg.

The door of the luggage compartment opened easily at the pressure of her finger, and her craning neck—

There was a definite human sound that broke off sharply.

Arcadia solidified. Silence! Still silence!

She tried to poke her eyes outside the door without moving her head and failed. The head followed the eyes.

Homir Munn was awake, of course—reading in bed, bathed in the soft, unspreading bed light, staring into the darkness with wide eyes, and groping one hand stealthily under the pillow.

Arcadia's head moved sharply back of itself. Then, the light went out entirely and Munn's voice said with shaky sharpness: "I've got a blaster, and I'm shooting, by the Galaxy—"

And Arcadia wailed: "It's only me. Don't shoot."

...AND NOW YOU DON'T

Remarkable what a fragile flower romance is. A gun with a nervous operator behind it can spoil the whole thing.

The light was back on—all over the ship—and Munn was sitting up in bed. The somewhat grizzled hair on his thin chest and the sparse one-day growth on his chin lent him an entirely fallacious appearance of disreputability.

Arcadia stepped out, yanking at her metallene jacket which was supposed to be guaranteed wrinkle-proof.

After a wild moment in which he almost jumped out of bed, but remembered, and instead yanked the sheet up to his shoulders, Munn gargled: "W . . . wha . . . what—"

He was completely incomprehensible.

Arcadia said meekly: "Would you excuse me for a minute? I've got to wash my hands." She knew the geography of the vessel, and slipped away quickly. When she returned, with her courage oozing back, Homir Munn was standing before her with a faded bathrobe on the outside and a brilliant fury on the inside.

"What the black holes of Space are you d . . . doing aboard this ship? H . . . how did you get on here? What do you th . . . think I'm supposed to do with you? What's going on here?"

He might have asked questions

indefinitely, but Arcadia interrupted sweetly: "I just wanted to come along, Uncle Homir."

"Why? I'm not going anywhere?"

"You're going to Kalgan for information about the Second Foundation?"

And Munn let out a wild howl and collapsed completely. For one horrified moment, Arcadia thought he would have hysterics or beat his head against the wall. He was still holding the blaster and her stomach grew ice-cold as she watched it.

"Watch out— Take it easy—" was all she could think of to say.

But he struggled back to relative normality and threw the blaster on to the bunk with a force that should have set it off and blown a hole through the ship's hull.

"How did you get on?" he asked slowly, as though gripping each word with his teeth very carefully to prevent it from trembling before letting it out.

"It was easy. I just came into the hangar with my suitcase, and said, 'Mr. Munn's baggage!' and the man in charge just waved his thumb without even looking up."

"I'll have to take you back, you know," said Homir, and there was a sudden wild glee within him at the thought. By Space, this wasn't his fault.

"You can't," said Arcadia, calmly, "it would attract attention."

"What?"

"You know. The whole purpose

of *your* going to Kalgan was because it was natural for you to go and ask for permission to look into the Mule's records. And you've got to be so natural that you're to attract no attention at all. If you go back with a girl stowaway, it might even get into the tele-news reports."

"Where did you g . . . get those notions about Kalgan? These . . . uh . . . childish—" He was far too flippant for conviction, of course, even to one who knew less than did Arcadia.

"I heard," she couldn't avoid pride completely, "with a sound-recorder. I know all about it—so you've *got* to let me come along."

"What about your father?" He played a quick trump. "For all he knows, you're kidnaped . . . dead."

"I left a note," she said, overtrumping, "and he probably knows he mustn't make a fuss, or anything. You'll probably get a spacegram from him."

To Munn the only explanation was sorcery, because the receiving signal sounded wildly two seconds after she finished.

She said: "That's my father, I bet," and it was.

The message wasn't long and it was addressed to Arcadia. It said: "Thank you for your lovely present, which I'm sure you put to good use. Have a good time."

"You see," she said, "that's instructions."

TO BE CONTINUED





# OVER THE TOP

BY LESTER DEL REY

*The first man on Mars—in a ruined rocket—was in a fine, impartial position to listen to the insanities of Earth building up another war. Surely, he, of all men, could do least about it, and was least concerned!*

Illustrated by Orban

The sky was lousy with stars—nasty little pinpoints of cold hostility that had neither the remoteness of space nor the friendly warmth of Earth. They didn't twinkle honestly, but tittered and snickered down. And there wasn't even one moon. Dave Mannen

knew better, but his eyes looked for the low scudding forms of Deimos and Phobos because of all the romanticists who'd written of them. They were up there, all right, but only cold rocks, too small to see.

Rocks in the sky, and rocks in his head—not to mention the lump on

the back of his skull. He ran tense fingers over his wiry black hair until he found the swelling, and winced. With better luck, he'd have had every inch of his three-foot body mashed to jelly, instead of that, though. Blast Mars!

He flipped the searchlight on and looked out, but the view hadn't improved any. It was nothing but a drab plain of tarnished reddish sand, chucked about in ridiculous pot-holes, running out beyond the light without change. The stringy ropes of plantlike stuff had decided to clump into balls during the night, but their bilious green still had a clabbered appearance, like the result of a three days' binge. There was a thin rime of frost over them, catching the light in little wicked sparks. That was probably significant data; it would prove that there was more water in the air than the scientists had figured, even with revised calculations from the twenty-four-inch lunar refractor.

But that was normal enough. The bright boys got together with their hundred-ton electronic slipsticks and brought forth all manner of results; after that, they had to send someone out to die here and there before they found why the sticks had slipped. Like Dave. Sure, the refractory tube linings were good for twenty-four hours of continual blast—tested under the most rigorous lab conditions, even tried on a couple of Moon hops.

So naturally, with Unitech's billionaire backer and new power han-

dling methods giving them the idea of beating the Services to Mars—no need to stop on the Moon even, they were that good—they didn't include spare linings. They'd have had to leave out some of their fancy radar junk and wait for results until the rocket returned.

Well, the tubes had been good. It was only after three hours of blasting, total, when he was braking down for Mars, that they began pitting. Then they'd held up after a fashion until there was only forty feet of free fall left—about the same as fifteen on Earth. The ship hadn't been damaged, had even landed on her tripod legs, and the radar stuff had come through fine. The only trouble was that Dave had no return ticket. There was food for six months, water for more by condensing and re-using; but the clicking of the air machine wouldn't let him forget his supply of breathing material was being emptied, a trickle at a time. And there was only enough there for three weeks, at the outside. After that, curtains.

Of course, if the bright boys' plans had worked, he could live on compressed air drawn from outside by the air lock pumps. Too bad the landing had sprung them just enough so they could barely hold their own and keep him from losing air if he decided to go outside. A lot of things were too bad.

But at least the radar was working fine. He couldn't breathe it or take off with it, but the crystal amplifiers would have taken even a free

fall all the way from mid-space. He cut the power on, fiddling until he found the lunar broadcast from Earth. It had a squiggly sound, but most of the words came through on the begacycle band. There was something about a fool kid who'd sneaked into a plane and got off the ground somehow, leaving a hundred honest pilots trying to kill themselves in getting him down. People could kill each other by the millions, but they'd go all out to save one spectacular useless life, as usual.

Then it came: "No word from the United Technical Foundation rocket, now fourteen hours overdue in reporting. Foundation men have given up hope, and feel that Mannen must have died in space from unknown causes, leaving the rocket to coast past Mars unmanned. Any violent crash would have tripped automatic signalers, and there was no word of trouble from Mannen—"

There was more, though less than on the kid. One rocket had been tried two years before, and gone wide because the tubes blew before reversal; the world had heard the clicking of Morse code right to the end, then. This failure was only a secondhand novelty, without anything new to gush over. Well, let them wonder. If they wanted to know what had happened, let 'em come and find out. There'd be no pretty last words from him.

Dave listened a moment longer, as the announcer picked up the latest rift in the supposedly refurbished United Nations, then cut off in dis-

gust. The Atlantic Nations were as determined as Russia, and both had bombs now. If they wanted to blast themselves out of existence, maybe it was a good thing. Mars was a stinking world, but at least it had died quietly, instead of raising all that fuss.

Why worry about them. They'd never done him any favors. He'd been gypped all along. With a Grade-A brain and a matinee idol's face, he'd been given a three-foot body and the brilliant future of a circus freak—the kind the crowd laughed at, rather than looked at with awe. His only chance had come when Unitech was building the ship, before they knew how much power they had, and figured on saving weight by designing it for a midget and a consequently smaller supply of air, water and food. Even then, after he'd seen the ad, he'd had to fight his way into position through days of grueling tests. They hadn't tossed anything in his lap.

It had looked like the big chance, then. Fame and statues they could keep, but the book and endorsement rights would have put him where he could look down and laugh at the six-footers. And the guys with the electronic brains had cheated him out of it.

Let them whistle for their radar signals. Let them blow themselves to bits playing soldier. It was none of his worry now.

He clumped down from the observatory tip into his tiny quarters, swallowed a couple of barbiturates,



and crawled into his sleeping cushions. Three weeks to go, and not even a bottle of whiskey on the ship. He cursed in disgust, turned over, and let sleep creep up on him.

It was inevitable that he'd go outside, of course. Three days of nothing but sitting, standing up, and sleeping was too much. Dave let the pumps suck at the air in the lock, zipping down his helmet over the soft rubber seal, tested his equipment, and waited until the pressure stood about even, outside and in. Then he opened the outer lock, tossed down the plastic ramp, and stepped out. He'd got used to the low gravity while still aboard, and paid no attention to it.

The tripod had dug into the sand, but the platform feet had kept the tubes in the open, and Dave swore at them softly. They looked good—except where part of one lining hung out in shreds. And with lining replacements, they'd be good—the blast had been cut off before the tubes themselves were harmed. He turned his back on the ship finally and faced out to the shockingly near horizon.

This, according to the stories, was supposed to be man's high moment—the first living human to touch the soil outside his own world and its useless satellite. The lock opened, and out stepped the hero—dying in pride with man's triumph and conquest of space! Dave pushed the rubbery flap of his helmet back against his lips, opened the orifice, and spat on the ground. If this was

an experience, so was last year's stale beer.

There wasn't even a "canal" within fifty miles of him. He regretted that, in a way, since finding out what made the streaks would have killed time. He'd seen them as he approached, and there was no illusion to them—as the lunar scope had proved before. But they definitely weren't water ditches, anyhow. There'd been no chance to pick his landing site, and he'd have to get along without them.

It didn't leave much to explore. The ropes of vegetation were stretched out now, holding up loops of green fuzz to the sun, but there seemed to be no variation of species to break up the pattern. Probably a grove of trees on Earth would look the same to a mythical Martian. Possibly they represented six million and seven varieties. But Dave couldn't see it. The only point of interest was the way they wiggled their fuzz back and forth, and that soon grew monotonous.

Then his foot squeaked up at him, winding up in a gurgle. He jumped a good six feet up in surprise, and the squeak came again in the middle of his leap, making him stumble as he landed. But his eyes focused finally on a dull brownish lump fastened to his boot. It looked something like a circular cluster of a dozen pine cones, with fuzz all over, but there were little leglike members coming out of it—a dozen of them that went into rapid motion as he looked.

"Queeklrle," the thing repeated, sending the sound up through the denser air in his suit. It scrambled up briskly, coming to a stop over his supply kit, and fumbling hurriedly. "Queeklrle!"

Oddly, there was no menace in it, probably because it was anything but a bug-eyed monster; there were no signs of any sensory organs. Dave blinked. It reminded him of a kitten he'd once had, somehow, before his usual luck found him and killed the little creature with some cat disease. He reacted automatically.

"Queekle yourself." His fingers slipped into the kit and came out with a chocolate square, unpeeling the cellophane quickly. "It'll probably make you sick or kill you—but if that's what you're after, take it."

Queekle was after it, obviously. The creature took the square in its pseudopods, tucked it under its body, and relaxed, making faint gobbling sounds. For a second, it was silent, but then it squeaked again, sharper this time. "Queeklrle!"

Dave fed it two more of the squares before the creature seemed satisfied, and began climbing back down, leaving the nuts in the chocolate neatly piled on the ground behind it. Then Queekle went scooting off into the vegetation. Dave grimaced; its gratitude was practically human.

"Nuts to you, too," he muttered, kicking the pile of peanuts aside. But it proved at least that men had never been there before—humans were almost as fond of exterminating

other life as they were of killing off their own kind.

He shrugged, and swung off toward the horizon at random in a loose, loping stride. After the cramped quarters of the ship, running felt good. He went on without purpose for an hour or more, until his muscles began protesting. Then he dug out his water bottle, pushed the tube through the helmet orifice, and drank briefly. Everything around him was the same as it had been near the ship, except for a small cluster of the plants that had dull red fuzz instead of green; he'd noticed them before, but couldn't tell whether they were one stage of the same plant or a different species. He didn't really care.

In any event, going further was purposeless. He'd been looking for another Queekle casually, but had seen none. And on the return route, he studied the ground under the fuzz plants more carefully, but there was nothing to see. There wasn't even a wind to break up the monotony, and he clumped up to the ramp of the ship as bored as he had left it. Maybe it was just as well his air supply was low, if this was all Mars had to offer.

Dave pulled up the ramp and spun the outer lock closed, blinking in the gloom, until the lights snapped on as the lock sealed. He watched the pressure guage rise to ten pounds, normal for the ship, and reached for the inner lock. Then he jerked back, staring at the floor.

Queekle was there, and had

brought along part of Mars. Now its squeaks came out in a steady stream as the inner seal opened. And in front of it, fifteen or twenty of the plant things went into abrupt motion, moving aside to form a narrow lane through which the creature went rapidly, on into the ship. Dave followed, shaking his head. Apparently there was no way of being sure about anything here. Plants that stood rock steady on their roots outside could move about at will, it seemed—and to what was evidently a command.

The fool beast! Apparently the warmth of the ship had looked good to it, and it was all set to take up housekeeping—in an atmosphere that was at least a hundred times too dense for it. Dave started up the narrow steps to his quarters, hesitated, and cursed. It still reminded him of the kitten, moving around in exploratory circles. He came back down, and made a dive for it.

Queekle let out a series of squeals as Dave tossed it back into the air lock and closed the inner seal. Its squeaks died down as the pressure was pumped back and the outer seal opened, though, and were inaudible by the time he moved back up the ladder. He grumbled to himself half-heartedly. That's what came of feeding the thing—it decided to move in and own him.

But he felt better as he downed what passed for supper. The lift lasted for an hour or so afterwards—and then left him feeling more cramped and disgusted than ever as

he sat staring at the walls of his tiny room. There wasn't even a book to read, aside from the typed manual for general care of the ship, and he'd read that often enough already.

Finally he gave up in disgust and went up to the observation tip and cut on the radar. Maybe his death notices would be more interesting tonight.

They weren't. They were carrying speculations about what had happened to him—none of which included any hint that the bright boys could have made an error. They'd even figured out whether Mars might have captured the ship as a satellite, and decided against it. But the news was losing interest, obviously, and he could tell where it had been padded out from the general broadcast to give the Lunar men more coverage—apparently on the theory that anyone as far out as the Moon would be more interested in the subject. They'd added one new touch, though:

"It seems obvious that further study of space conditions beyond the gravitic or magnetic field of Earth is needed. The Navy announced that its new rocket, designed to reach Mars next year, will be changed for use as a deep-space laboratory on tentative exploratory trips before going further. United Technical Foundation has abandoned all further plans for interplanetary research, at least for the moment."

And that was that. They turned the microphone over to international affairs then, and Dave frowned.



Even to him, it was obvious that the amount of words used had no relation to the facts covered. Already they were beginning to clamp down the lid, and that meant things were heading toward a crisis again. The sudden outbreak of the new and violent plague in China four years before had brought an end to the former crisis, as all nations pitched in through altruism or sheer self-interest, and were forced to work together. But that hadn't lasted; they'd found a cure after nearly two million deaths, and there had been nothing to hold the suddenly created co-operation of the powers. Maybe if they had new channels for their energies, such as the planets—

But it wouldn't wash. The Atlantic Nations would have taken over Mars on the strength of his landing and return, and they were in the lead if another ship should be sent. They'd gobble up the planets as they had taken the Moon, and the other powers would simply have more fuel to feed their resentment, and bring things to a head.

Dave frowned more deeply as the announcer went on. There were the usual planted hints from officials that everything was fine for the Atlantic Powers—but they weren't usual. They actually sounded super-confidant—arrogantly so. And there was one brief mention of a conference in Washington, but it was the key. Two of the names were evidence in full. Someone had actually found a way to make the lithium bomb work, and—

Dave cut off the radar as it hit him. It was all the human race needed—a chance to use what could turn into a self-sustaining chain reaction. Man had finally discovered a way to blow up his planet.

He looked up toward the speck that was Earth, with the tiny spot showing the Moon beside it. Behind him, the air machine clicked busily, metering out oxygen. Two and a half weeks. Dave looked down at that, then. Well, it might be long enough, though it probably wouldn't. But he had that much time for certain. He wondered if the really bright boys expected as much for themselves. Or was it only because he wasn't in the thick of a complacent humanity, and had time for thinking that he could realize what was coming?

He slapped the air machine dully, and looked up at the Earth again. The fools! They'd asked for it; let them take their medicine now. They liked war better than eugenics, nuclear physics better than the science that could have found his trouble and set his glands straight to give him the body he should have had. Let them stew in their own juice.

He found the bottle of sleeping tablets, and shook it. But only specks of powder fell out. That was gone, too. They couldn't get anything right. No whiskey, no cigarettes that might use up the precious air, no more amytal. Earth was reaching out for him, denying him the distraction of a sedative, just as

she was denying herself a safe and impersonal contest for her clash of wills.

He threw the bottle onto the floor and went down to the air lock. Queekle was there—the faint sounds of scratching proved that. And it came in as soon as the inner seal opened, squeaking contentedly, with its plants moving slowly behind it. They'd added a new feature—a mess of rubbish curled up in the tendrils of the vines, mixed sand and dead plant forms.

"Make yourself to home," Dave told the creature needlessly. "It's all yours, and when I run down to the gasping point, I'll leave the locks open and the power on for the fluorescents. Somebody might as well get some good out of the human race. And don't worry about using up my air—I'll be better off without it, probably."

"Queeklrle." It wasn't a very brilliant conversation, but it had to do.

Dave watched Queekle assemble the plants on top of the converter shield. The bright boys had done fine, there—they'd learned to chain radiation and neutrons with a thin wall of metal and an intangible linkage of forces. The result made an excellent field for the vines, and Queekle scooted about, making sure the loads of dirt were spread out and its charges arranged comfortably, to suit it. It looked intelligent—but so would the behavior of ants. If the pressure inside the ship bothered the creature, there was no sign of it.

"Queek-lrle," it announced finally, and turned toward Dave. He let it follow him up the steps, found some chocolate, and offered it to the pseudopods. But Queekle wasn't hungry. Nor would the thing accept water, beyond touching it and brushing a drop over its fuzzy surface.

It squatted on the floor until Dave flopped down on his cushions, then tried to climb up beside him. He reached down, surprised to feel the fuzz give way instantly to a hard surface underneath, and lifted it up beside him. Queekle was neither cold nor warm; probably all Martian life had developed excellent insulation, and perhaps the ability to suck water out of the almost dehydrated atmosphere and then retain it.

For a second, Dave remembered the old tales of vampire beasts, but he rejected them at once. When you come down to it, most of the animal life wasn't too bad—not nearly as bad as man had pictured it to justify his own superiority. And Queekle seemed content to lie there, making soft monotonous little squeaks, and letting it go at that.

Surprisingly, sleep came quickly.

Dave stayed away from the ship most of the next two days, moving aimlessly, but working his energy out in pure muscular exertion. It helped, enough to keep him away from the radar. He found tongs and stripped the lining from the tubes, and that helped more, because it occupied his mind as well as his mus-

cles. But it was only a temporary expedient, and not good enough for even the two remaining weeks. He started out the next day, went a few miles, and came back. For a while then, he watched the plants that were thriving unbelievably on the converter shielding.

Queekle was busy among them, nipping off something here and there and pushing it underneath where its mouth was. Dave tasted one of the buds, gagged, and spat it out; the thing smelled almost like an Earth plant, but combined all the quintessence of sour and bitter with something that was outside his experience. Queekle, he'd found, didn't care for chocolate—only the sugar in it; the rest was ejected later in a hard lump.

And then there was nothing to do. Queekle finished its work and they squatted side by side, but with entirely different reactions; the Martian creature seemed satisfied.

Three hours later, Dave stood in the observatory again, listening to the radar. There was some music coming through at this hour—but the squiggly reception ruined that. And the news was exactly what he'd expected—a lot of detail about national things, a few quick words on some conference at the United Nations, and more on the celebration in Israel over the anniversary of becoming an independent nation. Dave's own memories of that were dim, but some came back as he listened. The old United Nations had done a lot of wrangling over that,

but it had been good for them, in a way—neither side had felt the issue offered enough chance for any direct gain to threaten war, but it kept the professional diplomats from getting quite so deeply into more dangerous grounds.

But that, like the Chinese plague, wouldn't come up again.

He cut off the radar, finally, only vaguely conscious of the fact that the rocket hadn't been mentioned. He could no longer even work up a feeling of disgust. Nothing mattered beyond his own sheer boredom, and when the air machine—

Then it hit him. There were no clicks. There had been none while he was in the tip. He jerked to the controls, saw that the meter indicated the same as it had when he was last here, and threw open the cover. Everything looked fine. There was a spark from the switch, and the motor went on when he depressed the starting button. When he released it, it went off instantly. He tried switching manually to other tanks, but while the valves moved, the machine remained silent.

The air smelled fresh, though—fresher than it had since the first day out from Earth, though a trifle drier than he'd have liked.

"Queekle!" Dave looked at the creature, watched it move nearer at his voice, as it had been doing lately. Apparently it knew its name now, and answered with the usual squeak and gurgle.

It was the answer, of course. No wonder its plants had been thriving.



They'd had all the carbon dioxide and water vapor they could use, for a change. No Earth plants could have kept the air fresh in such a limited amount of space, but Mars had taught her children efficiency through sheer necessity. And now he had six months, rather than two weeks.

Yeah, six months to do nothing but sit and wait and watch for the blowup that might come, to tell him he was the last of his kind. Six months with nothing but a squeaking burble for conversation, except for the radar news.

He flipped it on again with an impatient slap of his hand, then reached to cut it off. But words were already coming out:

"... Foundation will dedicate a plaque today to young Dave Mannen, the little man with more courage than most big men can hold. Andrew Buller, backer of the ill-fated Mars rocket, will be on hand to pay tribute—"

Dave kicked the slush off with his foot. They would bother with plaques at a time like this, when all he'd ever wanted was the right number of marks on United States currency. He snapped at the dials, twisting them, and grabbed for the automatic key as more circuits coupled in.

"Tell Andrew Buller and the whole Foundation to go—"

Nobody'd hear his Morse at this late stage, but at least it felt good.

He tried it again, this time with some Anglo-Saxon adjectives thrown in. Queekle came over to investigate the new sounds, and squeaked doubtfully. Dave dropped the key.

"Just human nonsense, Queekle. We also kick chairs when we bump into—"

"Mannen!" The radar barked it out at him. "Thank God, you got your radar fixed. This is Buller—been waiting here a week and more now. Never did believe all that folderol about it being impossible for it to be the radar at fault. *Oof*, your message still coming in and I'm getting the typescript. Good thing there's no FCC out there. Know just how you feel, though. Darned fools here. Always said they should have another rocket ready. Look, if your set is bad, don't waste it, just tell me how long you can hold out, and by Harry, we'll get another ship built and up there. How are you, what—"

He went on, his words piling up on each other as Dave went through a mixture of reactions that shouldn't have fitted any human situation. But he knew better than to build up hope. Even six months wasn't long enough—it took time to finish and test a rocket—more than he had. Air was fine, but men needed food, as well.

He hit the key again. "Two weeks' air in tanks. Staying with Martian farmer of doubtful intelligence, but his air too thin, pumps no good." The last he let fade out, ending with

ASTOUNDING SCIENCE-FICTION

an abrupt cut-off of power. There was no sense in their sending out fools in half-built ships to try to rescue him. He wasn't a kid in an airplane, crying at the mess he was in, and he didn't intend to act like one. That farmer business would give them enough to chew on; they had their money's worth, and that was that.

He wasn't quite prepared for the news that came over the radar later—particularly for the things he'd been quoted as saying. For the first time it occurred to him that the other pilot, sailing off beyond Mars to die, might have said things a little different from the clicks of Morse they had broadcast. Dave tried to figure the original version of "Don't give up the ship" as a sailor might give it, and chuckled.

And at least the speculation over their official version of his Martian farmer helped to kill the boredom. In another week at the most, there'd be an end to that, too, and he'd be back out of the news. Then there'd be more long days and nights to fill somehow, before his time ran out. But for the moment, he could enjoy the antics of nearly three billion people who got more excited over one man in trouble on Mars than they would have out of half the population starving to death.

He set the radar back on the Foundation wave length, but there was nothing there; Buller had finally run down, and not yet got his breath back. Finally, he turned

back to the general broadcast on the Lunar signal. It was remarkable how Man's progress had leaped ahead by decades, along with his pomposity, just because an insignificant midget was still alive on Mars. They couldn't have discovered a prettier set of half-truths about anybody than they had from the crumbs of facts he hadn't even known existed concerning his life.

Then he sobered. That was the man on the street's reaction. But the diplomats, like the tides, waited on no man. And his life made no difference to a lithium bomb. He was still going through a counter-reaction when Queckle insisted it was bedtime and persuaded him to leave the radar.

After all, not a single thing had been accomplished by his fool message.

But he snapped back to the messages as a new voice came on: "And here's a late flash from the United Nations headquarters. Russia has just volunteered the use of a completed rocketship for the rescue of David Mannen on Mars, and we've accepted the offer. The Russian delegation is still being cheered on the floor! Here are the details we now have. This will be a one-way trip, radar guided by a new bomb control method—no, here's more news! It will be guided by radar and an automatic searching head that will put it down within a mile of Mannen's ship. Unmanned, it can

take tremendous acceleration, and reach Mannen before another week is out! United Technical Foundation is even now trying to contact Mannen through a hookup to the big government high-frequency labs where a new type of receiver—"

It was almost eight minutes before Buller's voice came in, evidently while the man was still getting Dave's hurried message off the tape. "Mannen, you're coming in fine. O.K., those refractories—they'll be on the way to Moscow in six hours, some new type the scientists here worked out after you left. We'll send two sets this time to be sure, but they test almost twenty times as good as the others. We're still in contact with Moscow, and some details are still being worked on, but we're equipping their ship with the same type of refractories. Most of the other supplies will come straight from them—"

Dave nodded. And there'd be a lot of things he'd need—he'd see to that. Things that would be supplied straight from them. Right now, everything was milk and honey, and all nations were being the fool pilots rescuing the kid in the plane, suddenly bowled over by interplanetary success. But they'd need plenty later on to keep their diplomats busy—something to wrangle over and blow off steam that would be vented on important things, otherwise.

Well, the planets wouldn't be im-

portant to any nation for a long time, but they were spectacular enough. And just how was a planet claimed, if the man who landed was taken off in a ship that was a mixture of the work of two countries?

Maybe his theories were all wet, but there was no harm in the gamble. And even if the worst happened, all this might hold off the trouble long enough for colonies. Mars was still a stinking world, but it could support life if it had to.

"Queckle," he said slowly, "you're going to be the first Martian ambassador to Earth. But first, how about a little side trip to Venus on the way back, instead of going direct? That ought to drive them crazy, and tangle up their interplanetary rights a little more. Well? On to Venus, or direct home to Earth?"

"Queeklrle," the Martian creature answered. It wasn't too clear, but it was obviously a lot more like a two-syllable word.

Dave nodded. "Right! Venus."

The sky was still filled with the nasty little stars he'd seen the first night on Mars, but he grinned now as he looked up, before reaching for the key again. He wouldn't have to laugh at big men, after all. He could look up at the sky and laugh at every star in it. It shouldn't be long before those snickering stars had a surprise coming to them.

THE END





# GULF

BY ROBERT A. HEINLEIN

*The enemy wanted those films, and they were playing for keeps, with no holds or costs barred. The government agent had to get them through. But—where did the fat man with the talking cards fit in . . . ?*

Illustrated by Rogers

The first-quarter rocket from Moon Base put him down at Pied-à-Terre. The name he was traveling under began—by foresight—with the letter "A"; he was through port inspection and into the shuttle tube to the city ahead of the throng. Once in a tube car he went to the men's washroom and locked himself in.

Quickly he buckled on the safety belt he found there, snapped its

hooks to the wall fixtures, and leaned over awkwardly to remove a razor from his bag. The surge caught him in that position; despite the safety belt he bumped his head—and swore. He straightened up and plugged in the razor. His mustache vanished; he shortened his sideburns, trimmed the corners of his eyebrows, and brushed them up.

He towed his hair vigorously to

remove the oil that had sleeked it down, combed it loosely into a wavy mane. The car was now riding in a smooth, unaccelerated 300 mph; he let himself out of the safety belt without unhooking it from the walls and, working very rapidly, peeled off his moonsuit, took from his bag and put on a tweedy casual outfit suited to outdoors on Earth and quite unsuited to Moon Colony's air-conditioned corridors.

His slippers he replaced with walking shoes from the bag; he stood up. Joel Abner, commercial traveler, had disappeared; in his place was Captain Joseph Gilead, explorer, lecturer, and writer. Of both names he was the sole user; neither was his birth name.

He slashed the moonsuit to ribbons and flushed it down the water closet, added "Joel Abner's" identification cards, then peeled a plastic skin off his travel bag and let the bits follow the rest. The bag was now pearl gray and rough, instead of dark brown and smooth. The slippers bothered him; he was afraid they might stop up the car's plumbing. He contented himself with burying them in the waste receptacle.

The acceleration warning sounded as he was doing this; he barely had time to get back into the belt. But, as the car plunged into the solenoid field and surged to a stop, nothing remained of Joel Abner but some unmarked underclothing, very ordinary toilet articles, and nearly two dozen spools of microfilm, equally appropriate—until examined—to a com-

mercial traveler or a lecturer-writer. He planned not to let them be examined as long as he was alive.

He waited in the washroom until he was sure of being last man out of the car, then went forward into the next car, left by its exit, and headed for the lift to the ground level.

"New Age Hotel, sir," a voice pleaded near his ear. He felt a hand fumbling at the grip of his travel bag.

He repressed a reflex to defend the bag and looked the speaker over. At first glance he seemed an undersized adolescent in a smart uniform and a pillbox cap. Further inspection showed premature wrinkles and the features of a man at least forty. The eyes were glazed. A pituitary case, he thought to himself, and on the hop as well. "New Age Hotel," the runner repeated. "Best mechanos in town, chief. There's a discount if you're just down from the Moon."

Captain Gilead, when in town as Captain Gilead, always stayed at the old Savoy. But the notion of going to the New Age appealed to him; in that incredibly huge, busy, and ultramodern hostelry he might remain unnoticed until he had had time to do what had to be done.

He disliked mightily the idea of letting go his bag. Nevertheless it would be out of character not to let the runner carry the bag; it would call attention to himself—and the bag. He decided that this unhealthy runt could not outrun him even if he him-

self were on crutches; it would suffice to keep an eye on the bag.

"Lead on, comrade," he answered heartily, surrendering the bag. There had been no hesitation at all; he had let go the bag even as the hotel runner reached for it.

"O.K., chief." The runner was first man into an empty lift; he went to the back of the car and sat the bag down beside him. Gilead placed himself so that his foot rested firmly against his bag and faced forward as other travelers crowded in. The car started.

The lift was jammed; Gilead was subjected to body pressures on every side—but he noticed an additional, unusual, and uncalled-for pressure behind him.

His right hand moved suddenly and clamped down on a skinny wrist and a hand clutching something. Gilead made no further movement, nor did the owner of the hand attempt to draw away or make any objection. They remained so until the car reached the surface. When the passengers had spilled out he reached behind him with his left hand, recovered his bag and dragged the wrist and its owner out of the car.

It was, of course, the runner; the object in his fist was Gilead's wallet. "You darn near lost that, chief," the runner announced with no show of embarrassment. "It was falling out of your pocket."

Gilead liberated the wallet and stuffed it into an inner pocket. "Fell

right through the zipper no doubt," he answered cheerfully. "Well, let's find a cop."

The runt tried to pull away. "You got nothing on me!"

Gilead considered the defense. In truth, he had nothing. His wallet was already out of sight. As to witnesses, the other lift passengers were gone—nor had they seen anything. The lift itself was automatic. He was simply a man in the odd position of detaining another citizen by the wrist.

And Gilead himself did not want to talk to the police.

He let go the wrist. "On your way, comrade. We'll call it quits."

The runner did not move. "How about my tip?"

Gilead was beginning to like this rascal. Locating a loose half credit in his change pocket he flipped it at the runner, who grabbed it out of the air but still did not leave. "I'll take your bag now. Gimme."

"No, thanks, chum. I can find your lovely inn without further help. One side, please."

"Oh, yeah? How about my commission? I gotta carry your bag, else how they gonna know I brung you in? Gimme."

Gilead was delighted with the creature's unabashed insistence. He found a two-credit piece and passed it over. "There's your cumshaw. Now beat it."

"You and who else?"

Gilead chuckled and moved down the concourse toward the station entrance to the New Age Hotel. His



subconscious sentries informed him immediately that the runner had not gone back toward the lift as expected, but was keeping abreast him in the crowd. He considered this. The runner might be what he appeared to be, common city riffraff who combined casual thievery with his overt occupation. On the other hand—

He decided to unload. He stepped suddenly off the sidewalk into the entrance of a drugstore and stopped just inside the door to buy a newspaper. While his copy was being printed, he scooped up, apparently as an afterthought, three standard pneumo mailing tubes. As he paid for them he palmed a pad of gummed address labels.

A glance at the mirrored wall showed him that his shadow had hesitated outside but was still watching him. Gilead went on back to the shop's soda fountain and slipped into an unoccupied booth. Although the floor show was going on—a remarkably shapely ecdysiast was working down toward her last string of beads—he drew the booth's curtains.

Shortly the call light over the booth flashed discreetly; he called, "Come in!" A pretty and very young waitress came inside the curtain. Her plastic costume covered without concealing.

She glanced around. "Lonely?"

"No, thanks, I'm tired."

"How about a redhead, then? Real cute—"

"I really am tired. Bring me two

bottles of beer, unopened, and some pretzels."

"Suit yourself, sport." She left.

With speed he opened the travel bag, selected nine spools of micro-film, and loaded them into the three mailing tubes, the tubes being of the common three-spool size. Gilead then took the filched pad of address labels, addressed the top one to "Raymond Calhoun, P. O. Box 1060, Chicago" and commenced to draw with great care in the rectangle reserved for electric-eye sorter. This address he shaped in arbitrary symbols intended not to be read, but to be scanned automatically. The hand-written address was merely a precaution, in case a robot sorter should reject his hand-drawn symbols as being imperfect and thereby turn the tube over to a human postal clerk for readdressing.

He worked fast, but with the care of an engraver. The waitress returned before he had finished. The call light warned him; he covered the label with his elbow and kept it covered.

She glanced at the mailing tubes as she put down the beer and a bowl of pretzels. "Want me to mail those?"

He had another instant of split-second indecision. When he had stepped out of the tube car he had been reasonably sure, first, that the *persona* of Joel Abner, commercial traveler, had not been penetrated, and, second, that the transition from Abner to Gilead had been accom-

plished without arousing suspicion. The pocket-picking episode had not alarmed him, but had caused him to reclassify those two propositions from calculated certainties to unproved variables. He had proceeded to test them at once; they were now calculated certainties again—of the opposite sort. Ever since he had spotted his erstwhile porter, the New Age runner, as standing outside this same drugstore his subconscious had been clanging like a burglar alarm.

It was now clear not only that he had been spotted but that they were organized with a completeness and shrewdness he had not believed possible.

But it was mathematically probable to the point of certainty that they were not operating through this girl. They had no way of knowing that he would choose to turn aside into this particular drugstore. That she could be used by them he was sure—and she had been out of his sight since his first contact with her. But she was clearly not bright enough, despite her alley cat sophistication, to be approached, subverted, instructed, and indoctrinated to the point where she could seize an unexpected opportunity, all in a space of time merely adequate to fetch two bottles of beer. No, this girl was simply after a tip. Therefore she was safe.

But her costume offered no possibility of concealing three mailing tubes, nor would she be safe crossing the concourse to the post office.

He had no wish that she be found tomorrow morning dead in a ditch.

"No," he answered immediately, "I have to pass the post office anyway. But it was a kind thought. Here." He gave her a half credit.

"Thanks." She waited and stared meaningfully at the beer. He fumbled again in his change pocket, found only a few bits, reached for his wallet and took out a five-pluton note.

"Take it out of this."

She handed him back three singles and some change. He pushed the change toward her, then waited, frozen, while she picked it up and left. Only then did he hold the wallet closer to his eyes.

It was not his wallet.

He should have noticed it before, he told himself. Even though there had been only a second from the time he had taken it from the runner's clutched fingers until he had concealed it in a front pocket, he should have known it—known it and forced the runner to disgorge, even if he had had to skin him alive.

But why was he sure that it was not his wallet? It was the proper size and shape, the proper weight and feel—real ostrich skin in these days of synthetics. There was the weathered ink stain which had resulted from carrying a leaky stylus in the same pocket. There was a V-shaped scratch on the front which had happened so long ago he did not recall the circumstances.

Yet it was not his wallet.

He opened it again. There was the proper amount of money, there were what seemed to be his Explorers' Club card and his other identity cards, there was a dog-eared flat-photo of a mare he had once owned. Yet the more the evidence showed that it was his, the more certain he became that it was not his. These things were forgeries; they did not *feel* right.

There was one sure way to find out. He flipped a switch provided by a thoughtful management; the booth became dark. He took out his penknife and carefully slit a seam back of the billfold pocket. He dipped a finger into a secret pocket thus disclosed and felt around; the space was empty—nor on this point had the duplication of his own wallet been quite perfect; the space should have been lined, but his finger encountered rough leather.

He switched the light back on, put the wallet away, and resumed his interrupted drawing. The loss of the card which should have been in the concealed pocket was annoying, certainly awkward, and conceivably disastrous, but he did not judge that the information on it was jeopardized by the loss of the wallet. The card was quite featureless unless examined by black light; if exposed to visible light—by someone taking the real wallet apart, for example—it had the disconcerting quality of bursting explosively into flame.

He continued to work, his mind busy with the wider problem of why they had taken so much trouble to

try to keep him from knowing that his wallet was being stolen—and the still wider and more disconcerting question of why they had bothered with *his* wallet. Finished, he stuffed the remainder of the pad of address labels into a crack between the cushions in the booth, palmed the label he had prepared, picked up the bag and the three mailing tubes. One tube he kept separate from the others by a finger.

No attack would take place, he judged, in the drugstore. The crowded concourse between himself and the post office he would ordinarily have considered equally safe—but not today. A large crowd of people, he knew, were equal to so many trees as witnesses if the dice were loaded with any sort of a diversion.

He slanted across the bordering sidewalk and headed directly across the middle toward the post office, keeping as far from other people as he could manage. He had become aware of two men converging on him when the expected diversion took place.

It was a blinding light and a loud explosion, followed by screams and startled shouts. The source of the explosion he could imagine; the screams and shouts were doubtless furnished free by the public. Being braced, not for this, but for anything, he refrained even from turning his head.

The two men closed rapidly, as on cue.

Most creatures and almost all hu-



mans fight only when pushed; this can lose them decisive advantage. The two men made no aggressive move of any sort, other than to come closer to Gilead—nor did they ever attack.

Gilead kicked the first of them in the knee cap, using the side of his foot, a much more certain stroke than with the toe. He swung wide with his travel bag against the other at the same time, not hurting him but bothering him, spoiling his timing. Gilead followed it with a heavy kick to the man's stomach.

The man whose knee cap he had ruined was on the pavement, but still active—reaching for something, a gun or a knife. Gilead kicked him in the head and stepped over him, continued toward the post office.

Slow march—slow march all the way! He must not give the appearance of running away; he must be the perfect respectable citizen, going about his lawful occasions.

The post office came closer, and still no tap on the shoulder, no denouncing shout, no hurrying footsteps. He reached the post office, was inside. The opposition's diversion had worked, perfectly—but for Gilead, not for them.

There was a short queue at the addressing machine. Gilead joined it, took out his stylus and wrote addresses on the tubes while standing. A man joined the queue almost at once; Gilead made no effort to keep him from seeing what address he was writing; it was "Captain Joseph

Gilead, The Explorers' Club, New York." When it came his turn to use the symbol-printing machine he still made no effort to conceal what keys he was punching—and the symbol address matched the address he had written on each tube.

He worked somewhat awkwardly as the previously prepared gummed label was still concealed in his left palm.

He went from the addressing machine to the mailing receivers; the man who had been behind him in line followed him without pretending to address anything.

*Thwunk!* and the first tube was away with a muted implosion of compressed air. *Thwunk!* again and the second was gone—and at the same time Gilead grasped the last one in his left hand, sticking the gummed label down firmly over the address he had just printed on it. Without looking at it he made sure by touch that it was in place, all corners sealed, then *thwunk!* it joined its mates.

Gilead turned suddenly and trod heavily on the feet of the man crowded close behind him. "Wups! pardon *me*," he said happily and turned away. He was feeling very cheerful; not only had he turned his dangerous charge over into the care of a mindless, utterly reliable, automatic machine which could not be coerced, bribed, drugged, nor subverted by any other means and in whose complexities the tube would be perfectly hidden until it reached a destination known only to Gilead,

but also he had just stepped on the corns of the opposition.

On the steps of the post office he paused beside a policeman who was picking his teeth and staring out at a cluster of people and an ambulance in the middle of the concourse. "What's up?" Gilead inquired.

The cop shifted his toothpick. "First some fool sets off fireworks," he answered, "then two guys get in a fight and blame near ruin each other."

"My goodness!" Gilead commented and set off diagonally toward the New Age Hotel.

He looked around for his pick-pocket friend in the lobby, did not see him. Gilead strongly doubted if the runt were on the hotel's staff. He signed in as Captain Gilead, ordered a suite appropriate to the *persona* he was wearing, and let himself be conducted to the lift.

Gilead encountered the runner coming down just as he and his bellman were about to go up. "Hi, Shorty!" he called out while deciding not to eat anything in this hotel. "How's business?"

The runt looked startled, then passed him by without answering, his eyes blank. It was not likely, Gilead considered, that the runt would be used after being detected; therefore some sort of drop box, call station, or headquarters of the opposition was actually inside the hotel. Very well, that would save everybody a lot of useless commuting—and there would be fun for all!

In the meantime he wanted a bath.

In his suite he tipped the bellman, who continued to linger. "Want some company?"

"No, thanks, I'm a hermit."

"Try this then." The bellman inserted Gilead's room key in the stereo panel, fiddled with the controls; the entire wall lighted up and faded away. A svelte blond creature, backed by a chorus line, seemed about to leap into Gilead's lap. "That's not a tape," the bellman went on, "that's a live transmission direct from the Tivoli. We got the best equipment in town."

"So you have," Gilead agreed, and pulled out his key. The picture blanked; the music stopped. "But I want a bath, so get out—now that you've spent four credits of my money."

The bellman shrugged and left. Gilead threw off his clothes and stepped into the 'fresher. Twenty minutes later, shaved, scrubbed, soaked, sprayed, pummeled, rubbed, scented, powdered, and feeling ten years younger, he stepped out. His clothes were gone.

His bag was still there; he looked it over. It seemed O.K., itself and contents. There were the proper number of microfilm spools—not that it mattered. Only three of the spools mattered and they were already in the mail. The rest were just shrubbery, copies of his own public lectures. Nevertheless he examined one of them, unspooling a few frames.

It was one of his own lectures all right—but not one he had had with him. It was one of his published transcriptions, available in any large bookstore. "Pixies everywhere," he remarked and put it back. Such attention to detail was admirable.

"Room service!"

The service panel lighted up. "Yes, sir?"

"My clothes are missing. Chase 'em up for me."

"The valet has them, sir."

"I didn't order valet service. Get 'em back."

The girl's voice and face were replaced, after a slight delay, by those of a man. "It is not necessary to order valet service here, sir. 'A New Age guest receives the best.'"

"O.K., but get 'em back. I've got a date with the Queen of Sheba."

"Very good, sir." The image faded.

With wry humor he reviewed his situation. He had already made the possibly fatal error of underestimating his opponent through—he now knew—visualizing that opponent in the unimpressive person of "the runt." Thus he had allowed himself to be diverted; he should have gone anywhere rather than to the New Age, even to the old Savoy, although that hotel, being a known stamping ground of Captain Gilead, was probably as thoroughly booby-trapped by now as this palatial dive.

He must not assume that he had more than a few more minutes to live. Therefore he must use those

few minutes to tell his boss the destination of the three important spools of microfilm. Thereafter, if he still were alive, he must replenish his cash to give him facilities for action—the amount of money in "his" wallet, even if it were returned, was useless for any major action. Thirdly, he must report in, close the present assignment, and be assigned to his present antagonists as a case in themselves, quite aside from the matter of the microfilm.

Not that he intended to drop Runt & Company even if not assigned to them. True artists were scarce—nailing him down by such a simple device as stealing his pants! He loved them for it and wanted to see more of them, as violently as possible.

Even as the image on the room service panel faded he was punching the scrambler keys on the room's communicator desk. It was possible—certain—that the scramble code he used would be repeated elsewhere in the hotel and the supposed privacy attained by scrambling thereby breached at once. This did not matter; he would have his boss disconnect and call back with a different scramble from the other end. To be sure, the call code of the station he was calling would thereby be breached, but it was more than worthwhile to expend and discard one relay station to get this message through.

Scramble pattern set up, he coded—not New Washington, but the relay station he had selected. A girl's face





showed on the screen. "New Age service, sir. Were you scrambling?"

"Yes."

"I am verree sorree, sir. The inside scrambling circuits are being repaired. I can scramble for you from the main board."

"No, thanks, I'll call in clear."

"I yam ve-ree sor-ree, sir."

There *was* one clear-code he could use—to be used only for crash priority. This was crash priority. Very well—

He punched the keys again without scrambling and waited. The same girl's face appeared presently. "I am verree sorree, sir; that code does not reply. May I help you?"

"You might send up a carrier pigeon." He cleared the board.

The cold breath on the back of his neck was stronger now; he decided to do what he could to make it awkward to kill him just yet. He reached back into his mind and coded in clear the *Star-Times*.

No answer.

He tried the *Clarion*—again no answer.

No point in beating his head against it; they did not intend to let him talk outside to anyone. He rang for a bellman, sat down in an easy-chair, switched it to "shallow massage", and luxuriated happily in the chair's tender embrace. No doubt about it; the New Age *did* have the best mechanos in town—his bath had been wonderful; this chair was superb. Both the recent austeri-

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ties of Moon Colony and the probability that this would be his last massage added to his pleasure.

The door dilated and a bellman came in—about his own size, Gilead noted. The man's eyebrows went up a fraction of an inch on seeing Gilead's oyster-naked condition. "You want company?"

Gilead stood up and moved toward him. "No, dearie," he said, grinning, "I want *you*"—at which he sank three stiffened fingers in the man's solar plexus.

As the man grunted and went down Gilead chopped him in the side of the neck with the edge of his hand.

The shoulders of the jacket were too narrow and the shoes too large; nevertheless two minutes later "Captain Gilead" had followed "Joel Abner" to oblivion and Joe, temporary and free-lance bellman, let himself out of the room. He regretted not being able to leave a tip with his predecessor.

He sauntered past the passenger lifts, firmly misdirected a guest who stopped him, and found the service elevator. By it was a door to the "quick drop". He opened it, reached out and grasped a waiting pulley belt, and, without stopping to belt himself into it, contenting himself with hanging on, he stepped off the edge. In less time than it would have taken him to parachute the drop he was picking himself up off cushions in the hotel basement and reflecting that lunar gravitation

surely played hob with a man's leg muscles.

He left the drop room and started out in an arbitrary direction, but walking as if he were on business and belonged where he was—any exit would do and he would find one eventually.

He wandered in and out of the enormous pantry, then found the freight door through which the pantry was supplied.

When he was thirty feet from it it closed and an alarm sounded. He turned back.

He encountered two policemen in one of the many corridors under the giant hotel and attempted to brush on past them. One of them stared at him, then caught his arm. "Captain Gilead—"

Gilead tried to squirm away, but without showing any skill in the attempt. "What's the idea?"

"You are Captain Gilead."

"And you're my aunt Sadie. Let go my arm, copper."

The policeman fumbled in his pocket with his other hand, pulled out a notebook. Gilead noted that the other officer had moved a safe ten feet away and had a Markheim gun trained on him.

"You, Captain Gilead," the first officer droned, "are charged on a sworn complaint with uttering a counterfeit five-pluton note at or about thirteen hours this date at the Grand Concourse drugstore in this city. You are cautioned to come peacefully and are advised that you need not speak at this time. Come

along." He put the notebook back in his pocket and urged Gilead forward.

The charge might or might not have something to it, thought Gilead; he had not examined closely the money in the substituted wallet. He did not mind being booked, now that the microfilm was out of his possession; to be in an ordinary police station with nothing more sinister to cope with than crooked cops and dumb desk sergeants would be easy street compared with remaining in this rabbit warren with Runt & Company searching for him.

On the other hand the situation was too pat, unless the police had arrived close on his heels and found the stripped bellman, got his story and started searching.

The second policeman kept his distance and did not lower the Markheim gun. That made other considerations academic. "O.K., I'll go," he protested. "You don't have to twist my arm that way."

They went up to the weather level and out to the street—and not once did the second cop drop his guard. Gilead relaxed and waited. A police car was balanced at the curb. Gilead stopped. "I'll walk," he said. "The nearest station is just around the corner. I want to be booked in my own precinct."

He felt a teeth-chattering chill as the blast from the Markheim hit him; he pitched forward on his face.

He was coming to, but still could not co-ordinate, as they lifted him

out of the car. By the time he found himself being half-carried, half-marched down a long corridor he was almost himself again, but with a gap in his memory. He was shoved through a door which clanged behind him. He steadied himself and looked around.

"Greetings, friend," a resonant voice called out. "Drag up a chair by the fire."

Gilead blinked, deliberately slowed himself down, and breathed deeply. His healthy body was fighting off the effects of the Markheim bolt; he was almost himself.

The room was a cell, old-fashioned, almost primitive. The front of the cell and the door were steel bars; the walls were concrete. Its only furniture, a long wooden bench, was occupied by the man who had spoken. He was fiftyish, of ponderous frame, heavy features set in a shrewd, good-natured expression. He was lying back on the bench, head pillowed on his hands, in animal ease. Gilead had seen him before.

"Hello, Dr. Baldwin."

The man sat up with a flowing economy of motion that moved his bulk as little as possible. "I'm not Dr. Baldwin—I'm not Doctor anything, though my name is Baldwin." He stared at Gilead. "But I know you—seen some of your lectures."

Gilead cocked an eyebrow. "A man would seem naked around the Association of Theoretical Physicists without a doctor's degree—and



you were at their last annual meeting."

Baldwin chuckled booming. "That accounts for it—that has to be my cousin on my father's side, Hartley M. Stuffy citizen, Hartley. I'll have to try to take the curse off the family name, now that I've met you, captain." He stuck out a huge hand. "Gregory Baldwin, 'Kettle Belly' to my friends. New and used helicopters is as close as I come to theoretical physics. *'Kettle Belly Baldwin, King of the Kopters'*—you must have seen my advertising."

"Now that you mention it, I have."

Baldwin pulled out a card. "Here. If you ever need one, I'll give you ten percent off for knowing old Hartley. Matter of fact, I can do well by you right now in a year-old Curtiss, a family car without a mark on it."

Gilead accepted the card and sat down. "Not at the moment, thanks. You seem to have an odd sort of office, Mr. Baldwin."

Baldwin chuckled again. "In the course of a long life these things happen, captain. I won't ask you why *you* are here—or what you're doing in that monkey suit. Call me Kettle Belly."

"O.K." Gilead got up and went to the door. Opposite the cell was a blank wall; there was no one in sight. He whistled and shouted—no answer.

"What's itching you, captain?" Baldwin asked gently.

Gilead turned. His cellmate had

dealt a solitaire hand on the bench and was calmly playing.

"I've got to raise the turnkey and send for a lawyer."

"Don't fret about it. Let's play some cards." He reached in a pocket. "I've got a second deck; how about some Russian bank?"

"No, thanks. I've got to get out of here." He shouted again—still no answer.

"Don't waste your lung power, captain," Baldwin advised him. "They'll come when it suits them and not a second before. I *know*. Come play with me; it passes the time." Baldwin appeared to be shuffling the two decks; Gilead could see that he was actually stacking the cards. The deception amused him; he decided to play—since the truth of Baldwin's advice was so evident.

"If you don't like Russian bank," Kettle Belly went on, "here is a game I learned as a kid." He paused and stared into Gilead's eyes. "It's instructive as well as entertaining, yet it's simple, once you catch on to it." He started dealing out the cards. "It makes a better game with two decks, because the black cards don't mean anything. Just the twenty-six red cards in each deck count—with the heart suit coming first. Each card scores according to its position in that sequence. The ace of hearts is one and the king of hearts counts thirteen; the ace of diamonds is next at fourteen and so on. Savvy?"

"Yes."

"And the blacks don't count."

They're blanks . . . spaces. Ready to play?"

"What are the rules?"

"We'll deal out one hand for free; you'll learn faster as you see it. Then, when you've caught on, I'll play you for a half interest in the atomics trust—or ten bits in cash." He resumed dealing, laying the cards out rapidly in columns, five to a row. He paused, finished. "It was my deal, so it's your count. See what you get."

It was evident that Baldwin's stacking had brought the red cards into groups, yet there was no evident advantage to it, nor was the count especially high—nor low. Gilead stared at it, trying to figure out the man's game. The cheating, as cheating, seemed too bald to be probable.

Suddenly the cards jumped at him, arranged themselves in a meaningful array. He read:

XTHXY  
CANXX  
XXXSE  
HEARX  
XUSXX

The fact that there were only two fives-of-hearts available had affected the spelling but the meaning was clear. Gilead reached for the cards. "I'll try one. I can beat that score." He dipped into the tips belonging to the suit's owner. "Ten bits it is."

Baldwin covered it. Gilead shuffled, making even less attempt to cover up than had Baldwin. He dealt:

WHATS  
XXXXX  
XYOUR  
GAMEX  
XXXXX

Baldwin shoved the money toward him and anted again. "O.K., my turn for revenge." He laid out:

XXIMX  
XONXX  
YOURX  
XXXXX  
XSIDE

"I win again," Gilead announced gleefully. "Ante up." He grabbed the cards and manipulated them:

YEAHX  
XXXXX  
PROVE  
XXITX  
XXXXX

Baldwin counted and said, "You're too smart for me. Gimme the cards." He produced another ten-bit piece and dealt again:

XXILX  
HELFX  
XXYOU  
XGETX  
OUTXX

"I should have cut the cards," Gilead complained, pushing the money over. "Let's double the bets." Baldwin grunted and Gilead dealt again:

XNUTS  
IMXXX  
SAFER  
XXINX  
XJAIL

"I broke your luck," Baldwin gloated. "We'll double it again:"

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XUXRX  
XNUTS  
THISX  
NOXXX  
XJAIL

The deal shifted:

KEEPIX  
XTALK  
INGXX  
XXXXX  
XBUDX

Baldwin answered:

THISX  
XXXXX  
XXNEW  
AGEXX  
XHOTL

As he stacked the cards again Gilead considered these new factors. He was prepared to believe that he was hidden somewhere in the New Age Hotel; in fact the counterproposition that his opponents had permitted two ordinary cops to take him away to a normal city jail was most unlikely—unless they had the jail as fully under control as they quite evidently had the hotel. Nevertheless the point was not proven. As for Baldwin, he might be on Gilead's side; more probably he was planted as an *agent provocateur*—or he might be working for himself.

The permutations added up to six situations, only one of which made it desirable to accept Baldwin's offer for help in a jail break—said situation being the least likely of the six.

Nevertheless, though he considered Baldwin a liar, net, he tentatively decided to accept. A static

situation brought him no advantage; a dynamic situation—*any* dynamic situation—he might turn to his advantage. But more data were needed. "These cards are sticky as candy," he complained. "You letting your money ride?"

"Suits." Gilead dealt again:

XXXXX  
WHYXX  
AMXXX  
XXXXI  
XHERE

"You have the worst luck," Baldwin commented:

FILMS  
ESCAPE  
BFORE  
XUXXX  
CRACK

Gilead swept up the cards, was about to "shuffle", when Baldwin said, "Oh oh, school's out." Footsteps could be heard in the passage. "Good luck, boy," Baldwin added.

Baldwin knew about the films, but had not used any of the dozen ways to identify himself as part of Gilead's own organization. Therefore he was planted by the opposition, or he was a third factor.

More important, the fact that Baldwin knew about the films proved his assertion that this was not a jail. It followed with bitter certainty that he, Gilead, stood no computable chance of getting out alive. The footsteps approaching the cell could be ticking off the last seconds of his life.

He knew now that he should have



found means to report the destination of the films before going to the New Age. But Humpty Dumpty was off the wall, entropy always increases—but the films *must* be delivered.

The footsteps were quite close.

Baldwin might get out alive.

But who was Baldwin?

All the while he was "shuffling" the cards. The action was not final; he had only to give them one true shuffle to destroy the message being set up in them. A spider settled from the ceiling, landed on the other man's hand. Baldwin, instead of knocking it off and crushing it, most carefully reached his arm out toward the wall and encouraged it to lower itself to the floor. "Better stay out of the way, Shorty," he said gently, "or one of the big boys is likely to step on you."

The incident, small as it was, determined Gilead's decision—and with it, the fate of a planet. He stood up and handed the stacked deck to Baldwin. "I owe you exactly ten-sixty," he said carefully. "Be sure to remember it—I'll see who our visitors are."

The footsteps had stopped outside the cell door.

There were two of them, dressed neither as police nor as guards; the masquerade was over. One stood well back, covering the maneuver with a Markheim; the other unlocked the door. "Back against the wall, Fatso," he ordered. "Gilead, out you come. And take it easy, or,

after we freeze you, I'll knock out your teeth just for fun."

Baldwin shuffled back against the wall; Gilead came out slowly. He watched for any opening but the leader backed away from him without once getting between him and the man with the Markheim. "Ahead of us and take it slow," he was ordered. He complied, helpless under the precautions, unable to run, unable to fight.

Baldwin went back to the bench when they had gone. He dealt out the cards as if playing solitaire, swept them up again, and continued to deal himself solitaire hands. Presently he "shuffled" the cards back to the exact order Gilead had left them in and pocketed them.

The message had read: XTELL-  
XFBSXPOBOXDEBT  
XXXCHI

His two guards marched Gilead into a room and locked the door behind him, leaving themselves outside. He found himself in a large, smartly furnished private office. On his right was a real window overlooking the city and a reach of the river; balancing it on the left hung a solid portraying a lunar landscape in convincing color and depth. In front of him was a rich but not ostentatious executive desk.

The lower part of his mind took in these details; his attention could be centered only on the person who sat at that desk. She was old but not senile, frail but not helpless. Her eyes were very much alive, her ex-

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pression serene. Her translucent, well-groomed hands were busy with a frame of embroidery.

On the desk in front of her were two pneumo mailing tubes, a pair of slippers, and some tattered, soiled remnants of cloth and plastic.

She looked up. "How do you do, Captain Gilead?" she said in a thin, sweet soprano suitable for singing hymns.

Gilead bowed. "Well, thank you—and you, Mrs. Keithley?"

"You know me, I see."

"Madame would be famous if only for her charities."

"You are kind. Captain, I will not waste your time. I had hoped that we could release you without fuss, but"—she indicated the two tubes in front of her—"you can see for yourself that we must deal with you further."

"So?"

"Come, now, captain. You mailed *three* tubes. These two are only dummies, and the third did not reach its apparent destination. It is possible that it was badly addressed and has been rejected by the sorting machines. If so, we shall have it in due course. But it seems much more likely that you found some way to change its address—likely to the point of pragmatic certainty."

"Or possibly I corrupted your servant."

She shook her head slightly. "We examined him quite thoroughly before—"

"Before he died?"

"Please, captain, let's not change

the subject. I must know where you sent that other tube. You cannot be hypnotized by ordinary means; you have an acquired immunity to hypnotic drugs. Your tolerance for pain extends beyond the threshold of unconsciousness. All of these things have already been proved, else you would not be in the job you are in; I shall not put either of us to the inconvenience of proving them again. Yet I must have that tube. What is your price?"

"You assume that I have a price."

She smiled. "If the old saw has any exceptions, history does not record them. Be reasonable, captain. Despite your admitted immunity to ordinary forms of examination, there are ways of breaking down—of *changing*—a man's character so that he becomes really quite pliant under examination . . . ways that we learned from the commissars. But those ways take time and a woman my age has no time to waste."

Gilead lied convincingly. "It's not your age, ma'am; it is the fact that you know that you must obtain that tube at once or you will never get it." He was hoping—more than that, he was *willing*—that Baldwin would have sense enough to examine the cards for one last message—and act on it. If Baldwin failed and he, Gilead, died, the tube would eventually come to rest in a dead-letter office and would in time be destroyed.

"You are probably right. Nevertheless, captain, I will go ahead with the usual technique if you insist upon

it. What do you say to ten million plutonium credits?"

Gilead believed her first statement. He reviewed in his mind the means by which a man bound hand and foot, or worse, could kill himself unassisted. "Ten million plutons and a knife in my back?" he answered. "Let's be practical."

"Convincing assurances would be given before you need talk."

"Even so, it is not my price. After all, you are worth at least five hundred million plutons."

She leaned forward. "I like you, captain. You are a man of strength. I am an old woman, without heirs. Suppose you became my partner—and my successor?"

"Pie in the sky."

"No, no! I mean it. My age and sex do not permit me actively to serve myself; I must rely on others. Captain, I am very tired of inefficient tools, of men who can let things be spirited away right from under their noses. Imagine!" She made a little gesture of exasperation, clutching her hand into a tiny claw. "You and I could go far, captain. I need you."

"But I do not need you, madame. And I won't have you."

She made no answer, but touched a control on her desk. A door on the left dilated; two men and a girl came in. The girl Gilead recognized as the waitress from the Grand Concourse Drugstore. They had stripped her bare, which seemed to him an unnecessary indignity since her

working uniform could not possibly have concealed a weapon.

The girl, once inside, promptly blew her top, protesting, screaming, using language unusual to her age and sex—an hysterical, thalamic outburst of volcanic proportions.

"Quiet, child!"

The girl stopped in midstream, looked with surprise at Mrs. Keithley, and shut up. Nor did she start again, but stood there, looking even younger than she was and somewhat aware of and put off stride by her nakedness. She was covered now with goose flesh. One tear cut a white line down her dust-smeared face, stopped at her lip. She licked at it and sniffled.

"You were out of observation once, captain," Mrs. Keithley went on, "during which time this person saw you twice. Therefore we will examine her."

Gilead shook his head. "She knows no more than a goldfish. But go ahead—five minutes of hypno will convince you."

"Oh, no, captain! Hypo we have, of course, already used—negatively, as you say. But hypno is sometimes fallible; if she is a member of your bureau, it is certain to be fallible." She signaled to one of the men attending the girl; he went to a cupboard and opened it. "I am old-fashioned," the old woman went on. "I trust simple mechanical means much more than I do the cleverest of clinical procedures."

Gilead saw the implements that



the man was removing from the cupboard and started forward. "Stop that!" he commanded. "There's no sense in doing that—"

He bumped his nose quite hard.

The man paid him no attention. Mrs. Keithley said: "Forgive me, captain. I should have told you that this room is not one room, but two. The partition is merely glass, but very special glass—I use the room for difficult interviews. There is no need to hurt yourself by trying to reach us."

"Just a moment!"

"Yes, captain?"

"Your time is already running out. Let the girl and me go free *now*. You are aware that there are several hundred men searching this city for me even now—and that they will not stop until they have taken it apart panel by panel."

"I think not. A man answering your description to the last factor caught the South Africa rocket twenty minutes after you registered at the New Age Hotel. He was carrying your identifications, your very own. He will not reach South Africa, but the manner of his disappearance will point to desertion rather than accident or suicide."

Gilead dropped the matter. "What do you plan to gain by abusing this child? You have all she knows; certainly you do not believe that we could afford to trust in such as she?"

Mrs. Keithley pursed her lips. "Frankly, I do not expect to learn anything from her. I may learn something from you."



"I see."

The leader of the two men looked questioningly at his mistress; she motioned him to go ahead. The girl stared blankly at him, plainly unaware of the uses of the equipment he had got out. He and his partner got busy.

Shortly the girl screamed, continued to scream for a few moments in a high ululation. Then it stopped as she fainted.

They roused her and stood her up again. She stood, swaying and staring stupidly at her poor hands, forever damaged even for the futile purposes to which she had been capable of putting them. Blood spread down her wrists and dripped on a plastic tarpaulin, placed there earlier by the second of the two men.

Gilead did nothing and said nothing. Knowing as he did that the tube he was protecting contained matters measured in millions of lives, the problem of the girl, as a problem, did not even arise. It disturbed a deep and very ancient part of his brain, but almost automatically he cut that part off and lived for the time in his forebrain.

Consciously he memorized the faces, skulls, and figures of the two men and filed the data under "personal". Thereafter he unobtrusively gave his attention to the scene out the window. He had been noting it all through the interview but he wanted to give it explicit thought. He recast what he saw in terms of what it would look like had he been able to look squarely out the window

and decided that he was on the ninety-first floor of the New Age Hotel and approximately one hundred and thirty meters from the north end. He filed this under "professional".

When the girl died, Mrs. Keithley left the room without speaking to him. The men gathered up what was left in the tarpaulin and followed her. Presently the two guards returned and, using the same fool-proof methods, took him back to his cell.

As soon as the guards had gone and Kettle Belly was free to leave his position against the wall he came forward and pounded Gilead on the shoulders. "Hi, boy! I'm sure glad to see you—I was scared I would never lay eyes on you again. How was it? Pretty rough?"

"No, they didn't hurt me; they just asked some questions."

"You're lucky. Some of those crazy cops play mean when they get you alone in a back room. Did they let you call your lawyer?"

"No."

"Then they ain't through with you. You want to watch it, kid."

Gilead sat down on the bench. "Want to play some more cards?"

"Don't mind if I do. I feel lucky." Baldwin pulled out the double deck, riffled through it. Gilead took them and did the same. Good! they were in the order he had left them in. He ran his thumb across the edges again—yes, even the black nulls were unchanged in

sequence; apparently Kettle Belly had simply stuck them in his pocket without examining them, without suspecting that a last message had been written into them. He felt sure that Baldwin would not have left the message set up if he had read it. Since he found himself still alive, he was much relieved to think this.

He gave the cards one true shuffle, then started stacking them. His first layout read:

XXXXX  
ESCAP  
XXATX  
XXXXX  
XONCE

"Gotcha that time!" Baldwin crowed. "Ante up:"

DIDXX  
XYOUX  
XXXXX  
XXXXX  
CRACK

"Let it ride," announced Gilead and took the deal:

XXNOX  
BUTXX  
XXXXX  
XLETS  
XXGOX

"You're too lucky to live," complained Baldwin. "Look—we'll leave the bets doubled and double the layout. I want a fair chance to get my money back."

His next layout read:

XXXXX  
XTHXN  
XXXXX  
THXYX

NEEDX  
XXXUX  
ALIVX  
XXXXX  
PLAYX  
XXXUP

"Didn't do you much good, did it?" Gilead commented, took the cards and started arranging them.

"There's something mighty funny about a man that wins all the time," Baldwin grumbled. He watched Gilead narrowly. Suddenly his hand shot out, grabbed Gilead's wrist. "I thought so!" he yelled. "A card sharp—"

Gilead shook his hand off. "Why, you obscene fat slug!"

"Caught you! *Caught you!*" Kettle Belly reclaimed his hold, grabbed the other wrist as well. They struggled and rolled to the floor.

Gilead discovered two things: this awkward, bulky man was an artist at every form of dirty fighting and he could simulate it convincingly without damaging his partner. His nerve holds were an inch off the nerve; his kneeings were to thigh muscle rather than to the crotch.

Baldwin tried for a chancery strangle; Gilead let him take it. The big man settled the flat of his forearm against the point of Gilead's chin rather than against his Adam's apple and proceeded to "strangle" him.

There were running footsteps in the corridor.

Gilead caught a glimpse of the



guards as they reached the door. They stopped momentarily; the bell of the Markheim was too big to use through the steel grating, the charge would be screened and grounded. Apparently they did not have pacifier bombs with them, for they hesitated. Then the leader quickly unlocked the door, while the man with the Markheim dropped back to the cover position.

Baldwin ignored them, while continuing his stream of profanity and abuse at Gilead. He let the first man almost reach them before he suddenly said in Gilead's ear, "Close your eyes!" At which he broke just as suddenly.

Gilead sensed an incredibly dazzling flash of light even through his eyelids. Almost on top of it he heard a muffled crack; he opened his eyes and saw that the first man was down, his head twisted at a grotesque angle.

The man with the Markheim was shaking his head; the muzzle of his weapon weaved around. Baldwin was charging him in a waddle, back and knees bent until he was hardly three feet tall. The blinded guard could hear him, let fly a charge in the direction of the noise; it passed over Baldwin.

Baldwin was on him; the two went down. There was another cracking noise of ruptured bone and another dead man. Baldwin stood up, grasping the Markheim, keeping it pointed down the corridor. "How are your eyes, kid?" he called out anxiously.

"They're all right."

"Then come take this chiller." Gilead moved up, took the Markheim. Baldwin ran to the dead end of the corridor where a window looked out over the city. The window did not open; there was no 'copter step beyond it. It was merely a straight drop. He came running back.

Gilead was shuffling possibilities in his mind. Events had moved by Baldwin's plan, not by his. As a result of his visit to Mrs. Keithley's "interview room" he was oriented in space. The corridor ahead and a turn to the left should bring him to the quick-drop shaft. Once in the basement and armed with a Markheim, he felt sure that he could fight his way out—with Baldwin in trail if the man would follow. If not—well, there was too much at stake.

Baldwin was into the cell and out again almost at once. "Come along!" Gilead snapped. A head showed at the bend in the corridor; he let fly at it and the owner of the head passed out on the floor.

"Out of my way, kid!" Baldwin answered. He was carrying the heavy bench on which they had "played" cards. He started up the corridor with it, toward the sealed window, gaining speed remarkably as he went.

His makeshift battering-ram struck the window heavily. The plastic bulged, ruptured, and snapped like a soap bubble. The bench went on through, disappeared from sight, while Baldwin teetered on hands and

knees, a thousand feet of nothingness under his chin.

"Kid!" he yelled. "Close in! Fall back!"

Gilead backed towards him, firing twice more as he did so. He still did not see how Baldwin planned to get out, but the big man had demonstrated that he had resourcefulness—and resources.

Baldwin was whistling through his fingers and waving. In violation of all city traffic rules a helicopter separated itself from the late afternoon throng, cut through a lane, and approached the window. It hovered just far enough away to keep from fouling its blades. The driver opened the door, a line snaked across and Kettle Belly caught it. With great speed he made it fast to the window's polarizer knob, then grabbed the Markheim. "You first," he snapped. "Hurry!"

Gilead dropped to his knees and grasped the line; the driver immediately increased his tip speed and tilted his rotor; the line tautened. Gilead let it take his weight, then swarmed across it. The driver gave him a hand up while controlling his craft like a highschool horse with his other hand.

The 'copter bucked; Gilead turned and saw Baldwin coming across, a fat spider on a web. As he himself helped the big man in, the driver reached down and cut the line. The ship bucked again and slid away.

There were already men standing in the broken window. "Get lost,

Steve!" Baldwin ordered. The driver gave his tip jets another notch and tilted the rotor still more; the 'copter swooped away. He eased it into the traffic stream and inquired, "Where to?"

"Set her for home—and tell the other boys to go home, too. No . . . you've got your hands full; I'll tell them." Baldwin crowded up into the other pilot seat, slipped on phones and settled a quiet-mike over his mouth. The driver adjusted his car to the traffic, set up a combination on his pilot, then sat back and opened a picture magazine.

Shortly Baldwin took off the phones and came back to the passenger compartment. "Takes a lot of 'copters to be sure you have one cruising by when you need it," he said conversationally. "Fortunately, I've got a lot of 'em. Oh, by the way, this is Steve Halliday. Steve, meet Joe— Joe, what is your last name?"

"Greene," answered Gilead.

"Howdy," said the driver and let his eyes go back to his magazine.

Gilead considered the situation. He was not sure that it had been improved. Kettle Belly, whatever he was, was more than a used 'copter dealer—and he knew about the films. This boy Steve looked like a harmless young extrovert—but, then, Kettle Belly himself looked like a lunk. He considered trying to overpower both of them, remembered Kettle Belly's virtuosity in rough-and-tumble fighting, and decided against it. Perhaps Kettle Belly really was on

his side, completely and utterly. He had heard rumors that the Department used more than one echelon of operatives and he had no way of being sure that he himself was at the top level.

"Kettle Belly," he went on, "could you set me down at the airport first? I'm in a hurry."

Baldwin looked him over. "Sure, if you say so. But I thought you would want to swap those duds. You're as conspicuous as a preacher at a stag party. And how are you fixed for cash?"

With his fingers Gilead counted the change that had come with the suit. A man without cash had one arm in a sling. "How long would it take?"

"Ten minutes extra, maybe."

Gilead thought again about Kettle Belly's fighting ability and decided that there was no way for a fish in water to get any wetter. "O.K." He settled back and relaxed completely.

Presently he turned again to Baldwin. "By the way, how did you manage to sneak in that dazzle bomb?"

Kettle Belly chuckled. "I'm a large man, Joe; there's an awful lot of me to search."

Gilead changed the subject. "How did you happen to be there in the first place?"

Baldwin sobered. "That's a long and complicated story. Come back some day when you're not in such a rush and I'll tell you all about it."

"I'll do that—soon."

"Good. Maybe I can sell you that used Curtiss at the same time."

The pilot alarm sounded; the driver put down his magazine and settled the craft on the roof of Baldwin's establishment.

Baldwin was as good as his word. He took Gilead to his office, sent for clothes—which showed up with great speed—and handed Gilead a wad of bills suitable to stuff a pillow. "You can mail it back," he said.

"I'll bring it back in person," promised Gilead.

"Good. Be careful out on the street. Some of our friends are sure to be around."

"I'll be careful." He left, as casually as if he had called there on business, but feeling less sure of himself than usual. Baldwin himself remained a mystery and, in his business, Gilead could not afford mysteries.

There was a public phone booth in the lobby of Baldwin's building. Gilead went in, scrambled, then coded a different relay station from the one he had attempted to use before. He gave his booth's code and instructed the operator to scramble back. In a matter of minutes he was talking to his chief in New Washington.

"Joe! Where have you been?"

"Later, boss—get this." In departmental oral code as an added precaution, he told his chief that the films had been sent to Post Office Box 1060, Chicago, and insisted

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that they be picked up by a major force at once.

His chief turned away from the view plate, then returned, "O.K., it's done. Now what happened to you?"

"Later, boss, later. I think I've got some friends outside who are anxious to rattle with me. Keep me here and I may get a hole in my head."

"O.K.—but head right back here. I want a full report; I'll wait here for you."

"Right." He switched off.

He left the booth light-heartedly, with the feeling of satisfaction that comes from a hard job successfully finished. He rather hoped that some of his "friends" would show up; he felt like kicking somebody who needed kicking.

But they disappointed him. He boarded the transcontinental rocket without alarms and slept all the way to New Washington.

He reached the Federal Bureau of Security by one of many concealed routes and went to his boss' office. After scan and voice check he was let in. Bonn looked up and scowled.

Gilead ignored the expression: Bonn usually scowled. "Agent Joseph Briggs, three-four-oh-nine-seven-two, reporting back from assignment, sir," he said evenly.

Bonn switched a desk control to "recording" and another to "covert". "You are, eh? Why, thumb-fin-

gered idiot! how dare you show your face around here?"

"Easy now, boss—what's the trouble?"

Bonn fumed incoherently for a time, then said: "Briggs, twelve star men covered that pick up—and the box was empty. Post office box ten-sixty, Chicago, indeed! Where are those films? Was it a cover up? Have you got them with you?"

Gilead-Briggs restrained his surprise. "No. I mailed them at the Grand Concourse post office to the address you just named." He added, "The machine may have kicked them out; I was forced to letter by hand the machine symbols."

Bonn looked suddenly hopeful. He touched another control and said, "Carruthers! On that Briggs matter: check the rejection stations for that routing." He thought and then added, "Then try a rejection sequence on the assumption that the first symbol was acceptable to the machine but mistaken. Also for each of the other symbols; run them simultaneously—crash priority for all agents and staff. After that try combinations of symbols taken two at a time, then three at a time, and so on." He switched off.

"The total of that series you just set up is every postal address in the continent," Briggs suggested mildly. "It can't be done."

"It's got to be done! Man, have you any idea of the importance of those films you were guarding?"

"Yes. The director at Moon Base told me what I was carrying."

"You don't act as if you did. You've lost the most valuable thing this or any other government can possess—the absolute weapon. Yet you stand there blinking at me as if you had mislaid a pack of cigarettes."

"Weapon?" objected Briggs. "I wouldn't call the nova effect that, unless you class suicide as a weapon. And I don't concede that I've lost it. As an agent acting alone and charged primarily with keeping it out of the hands of others, I used the best means available in an emergency to protect it. That is well within the limits of my authority. I was spotted, by some means—"

"You shouldn't have been spotted!"

"Granted. But I was. I was unsupported and my estimate of the situation did not include a probability of staying alive. Therefore I had to protect my charge by some means which did not depend on my staying alive."

"But you *did* stay alive—you're here."

"Not my doing nor yours, I assure you. I should have been covered. It was your order, you will remember, that I act alone."

Bonn looked sullen. "That was necessary."

"So? In any case, I don't see what all the shooting is about. Either the films show up, or they are lost and will be destroyed as unclaimed mail. So I go back to the Moon and get another set of prints."

Bonn chewed his lip. "You can't do that."

"Why not?"

Bonn hesitated a long time. "There were just two sets. You had the originals, which were to be placed in a vault in the Archives—the others were to be destroyed at once when the originals were known to be secure."

"Yes? What's the hitch?"

"You don't see the importance of the procedure. Every working paper, every file, every record was destroyed when these films were made. Every technician, every assistant, received hypno. The intention was not only to protect the results of the research but to wipe out the very fact that the research had taken place. There aren't a dozen people in the system who even know of the existence of the nova effect."

Briggs had his own opinions on this point, based on recent experience, but he kept still about them. Bonn went on, "The secretary has been after me steadily to let him know when the originals were secured. He has been quite insistent, quite critical. When you called in, I told him that the films were safe and that he would have them in a few minutes."

"Well?"

"Don't you see, you fool—he gave the order at once to destroy the other copies."

Briggs whistled. "Jumped the gun, didn't he?"

"That's not the way he'll figure it—mind you, the President was pres-

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“suring *him*. He’ll say that *I* jumped the gun.”

“And so you did.”

“No, *you* jumped the gun. You told me the films were in that box.”

“Hardly. I said I had sent them there.”

“No, you didn’t.”

“Get out the tape and play it back.”

“There is no tape—by the President’s own order no records are kept on this operation.”

“So? Then why are you recording now?”

“Because,” Bonn answered sharply, “someone is going to pay for this and it is not going to be me.”

“Meaning,” Briggs said slowly, “that it is going to be me.”

“I didn’t say that. It might be the secretary.”

“If his head rolls, so will yours. No, both of you are figuring on using me. Before you plan on that, hadn’t you better hear my report? It might affect your plans. I’ve got news for you, boss.”

Bonn drummed the desk. “Go ahead. It had better be good.”

In a passionless monotone Briggs recited all events as recorded by sharp memory from receipt of the films on the Moon to the present moment. Bonn listened impatiently.

Finished, Briggs waited. Bonn got up and strode around the room. Finally he stopped and said: “Briggs, I never heard such a fantastic pack of lies in my life. A fat man who plays cards! A wallet that wasn’t your wallet—your clothes

stolen! And Mrs. Keithley—Mrs. *Keithley*! Don’t you know that she is one of the strongest supporters of the Administration?”

Briggs said nothing. Bonn went on, “Now I’ll tell you what actually did happen. Up to the time you grounded at Pied-à-Terre your report is correct, but—”

“How do you know?”

“Because you were covered, naturally. You don’t think I would trust this to one man, do you?”

“Why didn’t you tell me? I could have hollered for help and saved all this.”

Bonn brushed it aside. “You engaged a runner, dismissed him, went in that drugstore, came out and went to the post office. There was no fight in the Concourse for the simple reason that no one was following you. At the post office you mailed three tubes, one of which may or may not have contained the films. You went from there to the New Age Hotel, left it twenty minutes later and caught the trans-rocket for Cape Town. You—”

“Just a moment,” objected Briggs. “How could I have done that and still get back here?”

“Eh?” For a moment Bonn seemed stumped. “That’s just a detail; you were positively identified. For that matter, it would have been a far, far better thing for you if you had stayed on that rocket. In fact you’ll be better off for the time being if we assume officially that you did stay on that rocket. You are in a bad spot, Briggs, a very bad spot.



You did not muff this assignment—you sold out!"

Briggs looked at him levelly. "You are preferring charges?"

"Not just now. That is why it is best to assume that you stayed on that rocket—until matters settle down, clarify."

Briggs did not need a graph to show him what solution would come out when "matters clarified". He took from a pocket a memo pad, scribbled on it briefly, and handed it to Bonn.

It read: "I resign my appointment effective immediately." He had added signature, thumbprint, date, and hour.

"So long, boss," he added. He turned slightly, as if to go.

Bonn yelled: "Stop! Briggs, you are under arrest." He reached toward his desk.

Briggs cuffed him in the windpipe, added one to the pit of Bonn's stomach. He slowed down then and carefully made sure that Bonn would remain out for a satisfactory period. Examination of Bonn's desk produced a knockout kit; he added a two-hour hypodermic, placing it inconspicuously beside a mole near the man's backbone. He wiped the needle, restored everything to its proper place, removed the current record from the desk and wiped the tape of all mention of himself, including door check. He left the desk set to "covert" and "do not disturb" and left by another of the

concealed routes serving the building.

He went to the rocket port, bought a ticket, unreserved, for the first ship to Chicago. There was twenty minutes to wait; he made a couple of minor purchases from clerks rather than from machines, letting his face be seen. When the Chicago ship was called he crowded forward with the rest.

At the inner gate, just short of the weighing-in platform, he became part of the crowd present to see passengers off, rather than a passenger himself. He waved at someone in the line leaving the weighing station beyond the gate, smiled, called out a good-by, and let the crowd carry him back from the gate as it closed. He peeled off from the crowd at the men's washroom. When he came out there were several hasty but effective changes in his appearance.

More important, his manner was different.

A short, illicit transaction in a saloon near a hiring hall provided the work card he needed; fifty-five minutes later he was headed across country as Jack Gillespie, loader and helper-driver on a diesel freighter.

Could his addressing of the pneumo tube have been bad enough to cause the automatic postal machines to reject it? He let the picture of the label, as it had been when he had completed it, build in his mind until it was as sharp as the countryside flowing past him. No, his let-

tering of the symbols had been perfect and correct; the machines would accept it.

Could the machine have kicked out the tube for another cause, say a turned up edge of the gummed label? Yes, but the written label was sufficient to enable a postal clerk to get it back in the groove. One such delay did not exceed ten minutes, even during the rush hour. Even with five such delays the tube would have reached Chicago more than one hour before he reported to Bonn by phone.

Suppose the gummed label had peeled off entirely; in such case the tube would have gone to the same destination as the two cover-up tubes.

In which case Mrs. Keithley would have got it, since she had been able to intercept or receive the other two.

In which case she would not have attempted to crack or bribe him.

Therefore the tube had reached the Chicago post office box.

Therefore Kettle Belly *had* read the message in the stacked cards, had given instructions to some one in Chicago, had done so while at the helicopter's radio. After an event, "possible" and "true" are equivalent ideas, whereas "probable" becomes a measure of one's ignorance. To call a conclusion "improbable" *after the event* was self-confusing amphigory.

Therefore Kettle Belly Baldwin had the films—a conclusion he had reached in Bonn's office.

Two hundred miles from New Washington he worked up an argument with the top driver and got himself fired. From a phone booth in the town where he was dropped he scrambled through to Baldwin's business office. "Tell him I'm a man who owes him money."

Shortly the big man's face built up on the screen. "Hi, kid! How's tricks?"

"I'm fired."

"I thought you would be."

"Worse than that—I'm wanted."

"Naturally."

"I'd like to talk with you."

"Swell. Where are you?"

Gilead told him.

"You're clean?"

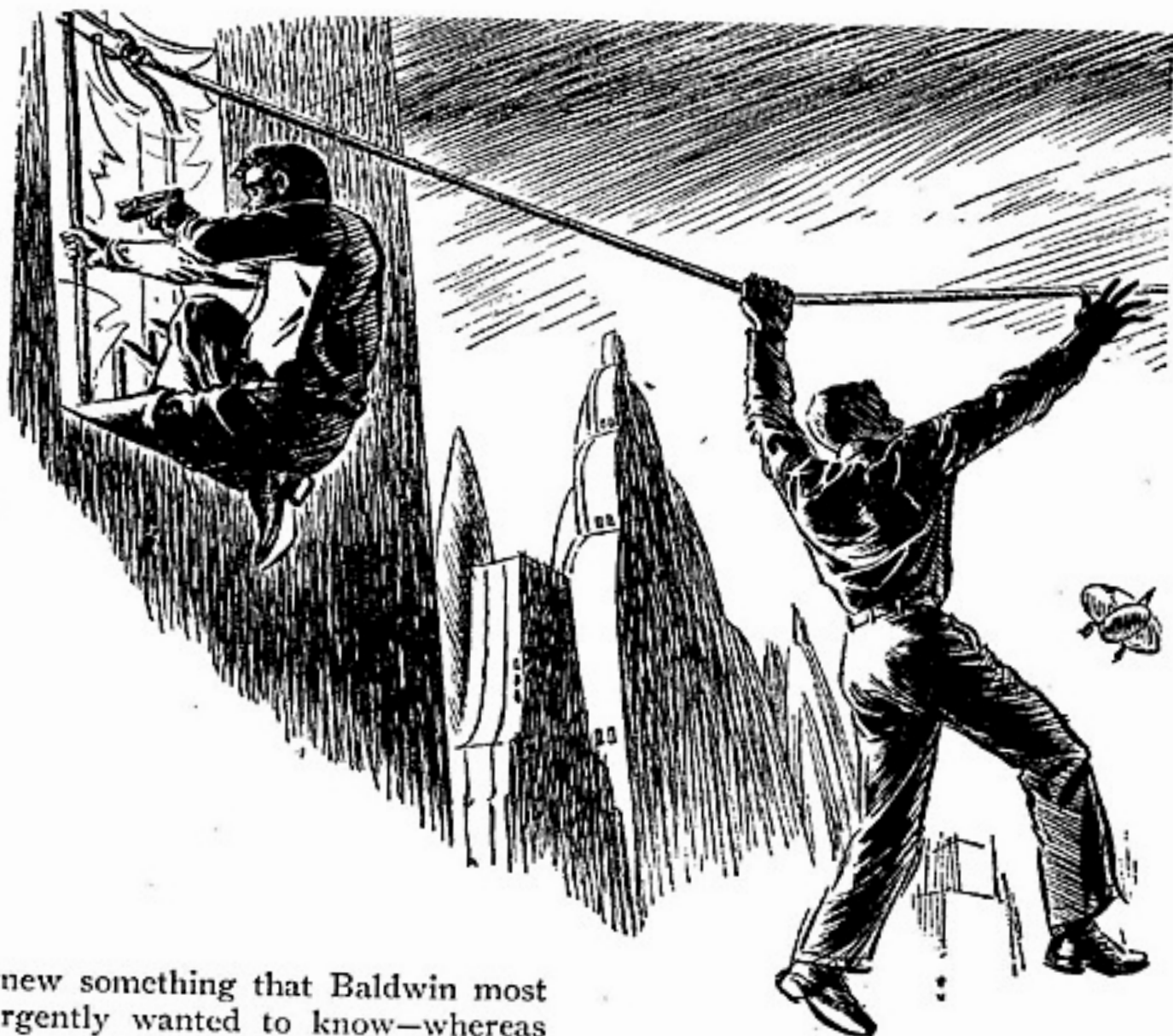
"For a few hours, at least."

"Go to the local airport. Steve will pick you up."

Steve did so, nodded a greeting, jumped his craft into the air, set his pilot, and went back to his reading. When the ship settled down on course, Gilead noted it and asked: "Where are we going?"

"The boss' ranch. Didn't he tell you?"

"No." Gilead knew that it was possible that he was being taken for a one-way ride. True, Baldwin had enabled him to escape an otherwise predictably certain death—he was sure that Mrs. Keithley had not intended to let him stay alive longer than suited her uses, else she would not have had the girl killed in his presence. Until he had arrived at Bonn's office, he had assumed that Baldwin had saved him because he



knew something that Baldwin most urgently wanted to know—whereas now it looked as if Baldwin had saved him for altruistic reasons.

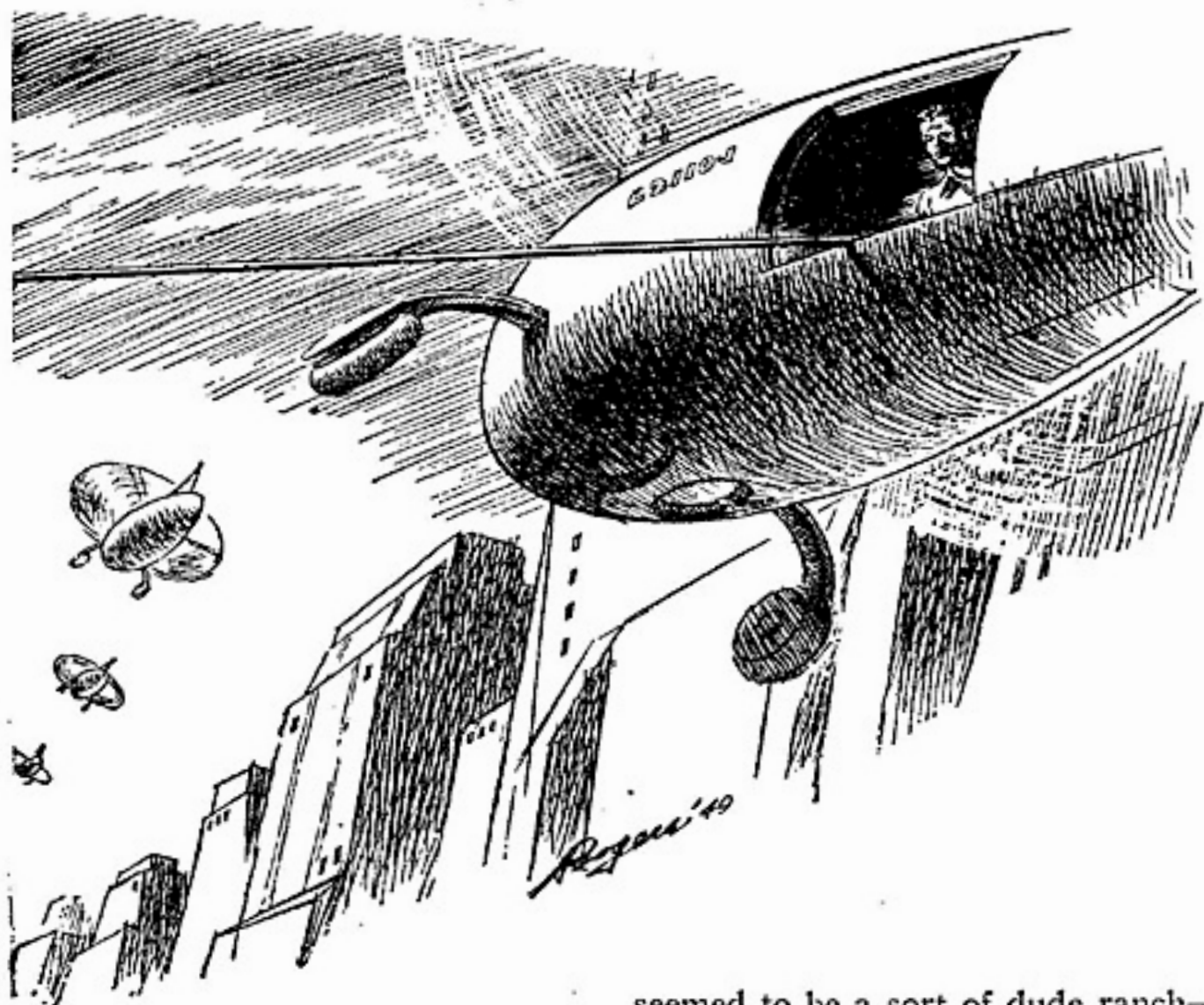
Gilead conceded the existence in this world of altruistic reasons, but was inclined not to treat them as "least hypothesis" until all other possible hypotheses had been eliminated; Baldwin might have had his own reasons for wishing him to live long enough to report to New Washington and nevertheless be pleased to wipe him out now that he was a wanted man whose demise would cause no comment.

Baldwin might even be a partner in these dark matters with Mrs. Keithley. In some ways that was the simplest explanation though it left other factors unexplained. In any case Baldwin was a key actor—and he had the films. The risk was necessary.

Gilead did not worry about it. The factors known to him were chalked up on the blackboard of his mind, there to remain until enough variables became constants to permit a solution by logic. The ride

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was very pleasant.

Steve put him down on the lawn of a large rambling ranch house, introduced him to a motherly old party named Mrs. Garver, and took off. "Make yourself at home, Joe," she told him. "Your room is the last one in the east wing—shower across from it. Supper in ten minutes."

He thanked her and took the suggestion, getting back to the living room with a minute or two to spare. Several others, a dozen or more of both sexes, were there. The place

seemed to be a sort of dude ranch—not entirely dude, as he had seen Herefords on the spread as Steve and he were landing.

The other guests seemed to take his arrival as a matter of course. No one asked why he was there. One of the women introduced herself as Thalia Wagner and then took him around the group. Ma Garver came in swinging a dinner bell as this was going on and they all filed into a long, low dining room. Gilead could not remember when he had had so good a meal in such amusing company.

After eleven hours of sleep, his first real rest in several days, he came fully, suddenly awake at a group of sounds his subconscious could not immediately classify and refused to discount. He opened his eyes, swept the room with them, and was at once out of bed, crouching on the side away from the door.

There were hurrying footsteps moving past his bedroom door. There were two voices, one male, one female, outside the door; the female was Thalia Wagner, the man he could not place.

Male: "tsumaeq?"

Female: "no!"

Male: "zUIntsi."

Female: "ipbit' New Jersey."

These are not precisely the sounds that Gilead heard, first because of the limitations of phonetic symbols, and second because his ears were not used to the sounds. Hearing is a function of the brain, not of the ear; his brain, sophisticated as it was, nevertheless insisted on forcing the sounds that reached his ears into familiar pockets rather than stop to create new ones.

Thalia Wagner identified, he relaxed and stood up. Thalia was part of the unknown situation he accepted in coming here; a stranger known to her he must accept also. The new unknowns, including the odd language, he filed under "pending" and put aside.

The clothes he had had were gone, but his money—Baldwin's money, rather—was where his clothes had been and with it his work card as

Jack Gillespie and his few personal articles. By them someone had laid out a fresh pair of walking shorts and new sneakers, in his size.

He noted, with almost shocking surprise, that someone had been able to serve him thus without waking him.

He put on the shorts and shoes and went out. Thalia and her companion had left while he dressed. No one was about and he found the dining room empty, but three places were set, including his own, for supper, and hot dishes and facilities were on the sideboard. He selected baked ham and hot rolls, fried four eggs, poured coffee. Twenty minutes later, warmly replenished and still alone, he stepped out on the veranda.

It was a beautiful day. He was drinking it and eying with friendly interest a desert lark when a young woman came around the side of the house. She was dressed much as he was, allowing for difference in sex, and she was comely, though not annoyingly so. "Good morning," he said.

She stopped, put her hands on her hips, and looked him up and down. "Well!" she said. "Why doesn't somebody tell me these things?"

Then she added: "Are you married?"

"No."

"I'm shopping around. Object: matrimony. Let's get acquainted."

"I'm a hard man to marry. I've been avoiding it for years."

"They're all hard to marry," she

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said bitterly. "There's a new colt down at the corral. Come on."

They went. The colt's name was War Conqueror of Baldwin; hers was Gail. After proper protocol with mare and son they left. "Unless you have pressing engagements," said Gail, "now is a salubrious time to go swimming."

"If salubrious means what I think it does, yes."

The spot was shaded by cottonwoods, the bottom was sandy; for a while he felt like a boy again, with all such matters as lies and nova effects and death and violence away in some improbable, remote dimension. After a long while he pulled himself up on the bank and said, "Gail, what does 'tsumaeq' mean?"

"Come again?" she answered. "I had water in my ear."

He repeated all of the conversation he had heard. She looked incredulous, then laughed. "You didn't hear that, Joe, you just didn't." She added, "You got the 'New Jersey' part right."

"But I did hear it."

"Say it again."

He did so, more carefully, and giving a fair imitation of the speaker's accents.

Gail chortled. "I got the gist of it that time. That Thalia! Some day some strong man is going to wring her neck."

"But what does it mean?"

Gail gave him a long, sidewise look. "If you ever find out, I really will marry you, in spite of your protests."

Someone was whistling from the hilltop. "Joe! Joe Greene—the boss wants you."

"Gotta go," he said to Gail. "G'bye."

"See you later," she corrected him.

Baldwin was waiting in a study as comfortable as himself. "Hi, Joe," he greeted him. "Grab a seatful of chair. They been treating you right?"

"Yes, indeed. Do you always set as good a table as I've enjoyed so far?"

Baldwin patted his middle. "How do you think I came by my nickname?"

"Kettle Belly, I'd like a lot of explanations."

"Joe, I'm right sorry you lost your job. If I'd had my druthers, it wouldn't have been the way it was."

"Are you working with Mrs. Keithley?"

"No. I'm against her."

"I'd like to believe that, but I've no reason to—yet. What were you doing where I found you?"

"They had grabbed me—Mrs. Keithley and her boys."

"They just happened to grab you—and just happened to stuff you in the same cell with me—and you just happened to know about the films I was supposed to be guarding—and you just happened to have a double deck of cards in your pocket? Now, really!"

"If I hadn't had the cards, we would have found some other way



to talk," Kettle Belly said mildly. "Wouldn't we, now?"

"Yes. Granted."

"I didn't mean to suggest that the setup was an accident. We had you covered from Moon Base; when you were grabbed—or rather as soon as you let them suck you into the New Age, I saw to it that they grabbed me, too; I figured I might have a chance to lend you a hand, once I was inside." He added, "I kinda let them think that I was an FBS man, too."

"I see. Then it was just luck that they locked us up together."

"Not luck," Kettle Belly objected. "Luck is a bonus that follows careful planning—it's never free. There was a computable probability that they would put us together in hopes of finding out what they wanted to know. We hit the jackpot because we paid for the chance. If we hadn't, I would have had to crush out of that cell and look for you—but I had to be inside to do it."

"Who is Mrs. Keithley?"

"Other than what she is publicly, I take it. She is the queen bee—or the black widow—of a gang. 'Gang' is a poor word—power group, maybe. One of several such groups, more or less tied together where their interests don't cross. Between them they divvy up the country for whatever they want like two cats splitting a gopher."

Gilead nodded; he knew what Baldwin meant, though he had not known that the enormously respected

Mrs. Keithley was in such matters—not until his nose had been rubbed in the fact. "And what are you, Kettle Belly?"

"Now, Joe— I like you and I'm truly sorry you're in a jam. You led wrong a couple of times and I was obliged to trump, as the stakes were high. See here, I feel that I owe you something; what do you say to this: we'll fix you up with a brand-new personality, vacuum tight—even new fingerprints if you want them. Pick any spot on the globe you like and any occupation; we'll supply all the money you need to start over—or money enough to retire and play with the cuties the rest of your life. What do you say?"

"No." There was no hesitation.

"You've no close relatives, no intimate friends. Think about it. I can't put you back in your job; this is the best I can do."

"I've thought about it. The devil with the job; I want to finish my case; you're the key to it."

"Reconsider, Joe. This is your chance to get out of affairs of state and lead a normal, happy life."

"'Happy,' he says!"

"Well, safe, anyhow. If you insist on going further your life expectancy becomes extremely problematical."

"I don't recall ever having tried to play safe."

"You're the doctor, Joe. In that case—" A speaker on Baldwin's desk uttered: "qoen: ɔR hɔg rylp."

Baldwin answered, "nU," and sauntered quickly to the fireplace. An early-morning fire still smoldered

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in it. He grasped the mantelpiece, pulled it toward him. The entire masonry assembly, hearth, mantel, and grate, came toward him, leaving an arch in the wall. "Duck down stairs, Joe," he said. "It's a raid."

"A secret door hole!"

"Yeah, corny, ain't it? This joint has more bolt holes than a rabbit's nest—and booby-trapped, too. Too many gadgets, if you ask me." He went back to his desk, opened a drawer, removed three film spools and dropped them in a pocket.

Gilead was about to go down the staircase; seeing the spools, he stopped. "Go ahead, Joe," Baldwin said urgently. "You're covered and outnumbered. With this raid showing up we wouldn't have time to fiddle; we'd just have to kill you."

They stopped in a room well underground, another study much like the one above, though lacking sunlight and view. Baldwin said something in the odd language to the mike on the desk, was answered. Gilead experimented with the idea that the lingo might be reversed English, discarded the notion.

"As I was saying," Baldwin went on, "if you are dead set on knowing all the answers—"

"Just a moment. What about this raid?"

"Just the government boys. They won't be rough and not too thorough. Ma Garver can handle them. We won't have to hurt anybody as

long as they don't use penetration radar."

Gilead smiled wryly at the disparagement of his own former service. "And if they do?"

"That gimmick over there squeals like a pig if it's touched by penetration frequencies. Even then we're safe against anything short of an A-bomb. They won't do that; they want the films, not a hole in the ground. Which reminds me— Here, catch."

Gilead found himself suddenly in possession of the films which were at the root of the matter. He unspooled a few frames and made certain that they were indeed the right films. He sat still and considered how he might get off this limb and back to the ground without dropping the eggs. The speaker again uttered something; Baldwin did not answer it but said: "We won't be down here long."

"Bonn seems to have decided to check my report." Some of his—former—comrades were upstairs. If he did Baldwin in, could he locate the inside control for the door?

"Bonn is a poor sort. He'll check me—but not too thoroughly; I'm rich. He won't check Mrs. Keithley at all; she's too rich. He thinks with his political ambitions instead of his head. His late predecessor was a better man—he was one of us."

Gilead's tentative plans underwent an abrupt reversal. His oath had been to a government; but his personal loyalty had been given to his former boss. "Prove that last re-

mark and I shall be much interested."

"No, you'll come to learn that it's true—if you still insist on knowing the answers. Through checking those films, Joe? Toss 'em back."

Gilead did not immediately do so. "I suppose you have made copies in any case?"

"Wasn't necessary; I looked at them. Don't get ideas, Joe; you're washed up with the FBS, even if you brought the films and my head back on a platter. You slugged your boss—remember?"

Gilead remembered that he had not told Baldwin so. He began to believe that Baldwin did have men inside the FBS, whether his late bureau chief had been one of them or not.

"I would at least be allowed to resign with a clear record. I know Bonn—officially he would be happy to forget it." He was simply stalling for time, waiting for Baldwin to offer an opening.

"Chuck them back, Joe. I don't want to rattle. One of us might get killed—both of us, if you won the first round. You can't prove your case, because I can prove I was home teasing the cat. I sold 'copters to two *very* respectable citizens at the exact time you would claim I was somewhere else." He listened again to the speaker, answered it in the same gibberish.

Gilead's mind evaluated his own tactical situation to the same answer that Baldwin had expressed.

Not being given to wishful thinking he at once tossed the films to Baldwin.

"Thanks, Joe." He went to a small oubliette set in the wall, switched it to full power, put the films in the hopper, waited a few seconds, and switched it off. "Good riddance to bad rubbish."

Gilead permitted his eyebrows to climb. "Kettle Belly, you've managed to surprise me."

"How?"

"I thought you wanted to keep the nova effect as a means to power."

"Nuts! Scalping a man is a poor way to cure him of dandruff. Joe, how much do you know about the nova effect?"

"Not much. I know it's sort of an atom bomb powerful enough to scare the pants off anybody who gets to thinking about it."

"It's not a bomb. It's not a weapon. It's a means of destroying a planet and everything on it completely—by turning that planet into a nova. If that's a weapon, military or political, then I'm Samson and you're Delilah.

"But I'm not Samson," he went on, "and I don't propose to pull down the Temple—nor let anybody else do so. There are moral lice around who would do just that, if anybody tried to keep them from having their own way. Mrs. Keithley is one such. Your boy friend Bonn is another such, if only he had the guts and the savvy—which he ain't. I'm bent on frustrating such

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people. What do you know about ballistics, Joe?"

"Grammar school stuff."

"Inexcusable ignorance." The speaker sounded again; he answered it without breaking his flow. "The problem of three bodies still lacks a neat general solution, but there are several special solutions—the asteroids that chase Jupiter in Jupiter's own orbit at the sixty-degree position, for example. And there's the straight-line solution—you've heard of the asteroid 'Earth-Anti'?"

"That's the chunk of rock that is always exactly on the other side of the Sun, where we never see it."

"That's right—only it ain't there any more. It's been novaed."

Gilead, normally immune to surprise, had been subjected to one too many. "Huh? I thought this nova effect was just theory?"

"Nope. If you had had time to scan through the films, you would have seen pictures of it. It's a plutonium, lithium, and heavy water deal, with some flourishes we won't discuss. It adds up to the match that can set afire a world. It did—a little world flared up and was gone."

"Nobody saw it happen. No one on Earth *could* see it, for it was behind the Sun. It couldn't even be seen from Moon Colony; the Sun still blanked it off from there—visualize the geometry. All that ever saw it were a battery of cameras in a robot ship. All who knew about it were the scientists who rigged it—and *all* of them were with us, except the director. If *he* had been, too,

you would never have been in this mix up."

"Dr. Finnley?"

"Yep. A nice guy, but a mind like a pretzel. A 'political' scientist, second-rate ability. He doesn't matter; our boys will ride herd on him until he's pensioned off. But we couldn't keep him from reporting and sending the films down. So I had to grab 'em and destroy them."

"Why didn't you simply save them? All other considerations aside, they would be unique in science."

"The human race doesn't need that bit of science, not this millennium. I saved all that mattered, Joe—in my head."

"You *are* your cousin Hartley, aren't you?"

"Of course. But I'm also Kettle Belly Baldwin, and several other guys."

"You can be Lady Godiva, for all of me."

"As Hartley, I was entitled to those films, Joe. It was my project. I instigated it, through my boys."

"I never credited Finnley with it. I'm not a physicist, but he obviously isn't up to it."

"Sure, sure. I was attempting to prove that an artificial nova could *not* be created; the political—the *racial*—importance of establishing the point is obvious. It backfired on me—so we had to go into emergency action."

"Perhaps you should have left well enough alone."

"No. It's better to know the

worst; now we can be alert for it, divert research away from it." The speaker growled again; Baldwin went on, "There may be a divine destiny, Joe, unlikely as it seems, that makes really dangerous secrets too difficult to be broached until intelligence reaches the point where it can cope with them—if said intelligence has the will and the good intentions. Ma Garver says to come up now."

They headed for the stairs. "I'm surprised that you leave it up to an old gal like Ma to take charge during an emergency."

"She's competent, I assure you. But I *was* running things—you heard me."

"Oh."

They settled down again in the above-surface study. "I give you one more chance to back out, Joe. It doesn't matter that you know all about the films, since they are gone and you can't prove anything—but beyond that— You realize that if you come in with us, are told what is going on, you will be killed deader than a duck at the first suspicious move?"

Gilead did; he knew in fact that he was already beyond the point of no return. With the destruction of the films went his last chance of rehabilitating his former main *persona*. This gave him no worry; the matter was done. He had become aware that, from the time he had admitted that he understood the first

message this man had offered him concealed in a double deck of cards, he no longer had been a free actor; his moves had been constrained by moves made by Baldwin. Yet there was no help for it; his future lay here or nowhere.

"I know it; go ahead."

"I know what your mental reservations are, Joe; you are simply accepting risk, not promising loyalty."

"Yes—but why are you considering taking a chance on me?"

Baldwin was more serious in manner than he usually allowed himself to be. "You're an able man, Joe. You have the savvy and the moral courage to do what is reasonable in an odd situation rather than what is conventional."

"That's why you want me?"

"Partly that. Partly because I like the way you catch on to a new card game." He grinned. "And even partly because Gail likes the way you behave with a colt."

"Gail? What's she got to do with it?"

"She reported on you to me about five minutes ago, during the raid."

"Hm-m-m—go ahead."

"You've been warned." For a moment Baldwin looked almost sheepish. "I want you to take what I say next at its face value, Joe—don't laugh."

"O.K."

"You asked what I was. I'm sort of the executive secretary of this branch of an organization of supermen."

"I thought so."

TO BE CONCLUDED

# FINAL COMMAND

BY A. E. VAN VOGT

*Most wars arise because the enemies do not understand each other. But this time the enemy didn't know who they were fighting!*

Illustrated by Brush

Barr stood on the hill—which overlooked Star, capitol of the human-controlled galaxy—and tried to make up his mind.

He was aware of his single robot guard standing somewhere in the darkness to his left. A man and a woman came along the crest of the hill, paused for a kiss, and then started down. Barr scarcely glanced at them. His problem embraced the whole civilization of man and robot, not individuals.

Even the escape of the alien enemy prisoner, a few hours before, had been an incident, when compared to the larger issues. True, he had seen it as a major event, and had ordered robot troops from distant cities to come to the capitol and aid in the search. But he had still to make the decision, which would fit those separate actions into a unified, driving purpose.

Behind him, there was a thud. Barr turned. He saw that an accident had taken place. The man and woman, evidently intent on each

other, had bumped into the robot guard. The guard, caught off balance, was now sprawled on the ground. The man bent down to help him up.

"I beg your pardon," he said, "I didn't—" He stopped. Finger contact with the clothes that covered the padding that, in turn, concealed the basic crystalline structure, must have apprised him of the other's identity. "Oh, you're a robot!"

He straightened without helping the guard to his feet. He said irritably: "I thought robots could see in the dark."

The guard climbed to his feet. "I'm sorry. My attention was elsewhere."

"Watch yourself!" said the man curtly.

That was all there was to the incident. It was a typical interchange between a robot and a human being. The man and the girl continued on down the hill. Presently, the lights of a car blinked on. They moved out of sight behind brush.



Barr walked over to the guard. What had happened was directly connected with the tremendous decision he had to make. He asked: "What was your feeling about that?" He decided he was not making himself clear. "Did you mind his taking the attitude that you were to blame?"

"Yes, I did." The guard had been brushing himself off. Now, he straightened. "After all, he was the one who was moving."

Barr persisted: "Did you have any impulse to rebel?" He regretted that question; it was too pointed. He said quickly: "Did you have any desire to talk back?"

The guard's reply was slow. "No! I had a sense of being involved in an emotional incident."

"But isn't it hard to come into contact with human beings on any but an emotional basis. Human beings are impatient, angry, generous, thoughtful, thoughtless." Barr paused. "I could go on."

"I suppose you're right, sir."

Thoughtfully, Barr turned to look again at the great city that spread below him. The star effect, which gave the capitol its name, was gained at night by a design of street lights. All the main centers had been deliberately grouped, so that by building and light concentration, the desired effect was achieved. Barr said finally, without looking around:

"Suppose that I, in my capacity of Director of the Council, ordered you to destroy yourself—" He hesitated. For him, the question he had in

mind merely touched the surface of his greater problem. For the guard, it would be basic. Nevertheless, he said finally, "What would your reaction be?"

The guard said: "First I'd check to see if you were actually giving the order in your official capacity."

"And then?" Barr added, "I mean, would that be sufficient?"

"Your authority derives from voters. It seems to me the Council cannot give such an order without popular support."

"Legally," said Barr, "it can deal with individual robots without recourse to any other authority." He added, "Human beings, of course, cannot be disposed of by the Council."

"I had the impression," said the guard, "that you meant robots, not only me."

Barr was briefly silent. He hadn't realized how strongly he was projecting his secret thoughts. He said at last: "As an individual, you obey orders given to you." He hesitated. "Or do you think plurality would make a difference?"

"I don't know. Give the order, and I'll see what I do."

"Not so fast!" said Barr. "We're not at the order-giving stage—" He paused; he finished the last word in his mind—*yet*.

Man is genes and neurons. Robot is crystals and electron tubes. A human neuron cell manufactures no impulses of its own; it transmits outside stimulation. A robot crys-

tal vibrates according to a steady impulse from a tube; the change in the impulse alters the rate of vibration. Such a change comes as the result of outside stimulation.

Man feeds himself, and permits surgical operations to maintain his organism at efficiency. Robot recharges his batteries and replaces his tubes. Both man and robot think. Man's organs deteriorate and his

tissues return to a primitive state. Robot's crystal is distorted by too many vibrations, and suffers the fatigue that is robot death. Is one less a life form than the other?

Such were the thoughts in Barr's mind.

From the beginning, men had *acted* as if robots were not really alive. Robots did the labor. They had just fought the greatest galactic



war in the history of Man. True, men had helped direct the strategy and decide the tactics. But for them, it was an armchair war. Robots manned the spaceships and landed under fire on alien planets.

At last, a few men had taken alarm at the predominant role played by robots in Man's civilization. Partly, it was fear of the robots; that was not openly admitted. Partly, it was a mental picture some men had of the defenseless state men would be in if the enemy ever penetrated robot defenses. Their suggested solution: Destroy all robots! Force men and women everywhere to take control again of their civilization!

It was believed that the vast majority of human beings were too decadent to resist such a decision until it was too late.

A divided Council had put the decision squarely up to Barr.

The guard, at Barr's direction, waved the surface car to a halt. It drew up, all its lights glittering, waited till they were aboard, then raced forward unerringly through the traffic.

A group of youths and girls piled on at the next stop. They stared in a blasé fashion at the bright Director's insignia on Barr's sleeve. But they rushed off into a brilliantly lighted amusement park when the car came to the end of its route.

Barr descended more slowly. He had come deliberately, seeking atmosphere and impressions. As he stepped to the ground, a flying robot

whisked past only a few hundred feet up. Then another, and a dozen more. He stepped to the sidewalk, and watched them, stimulated.

They were hovering now around a tower several hundred yards along the street. Cautiously, weapons visible and ready, they closed in on the upper reaches of the tower. Across the street, other robots—also wearing their flying attachments—swooped up to the top of a many-storied building. Like most business structures, it had entrances at each office where robots, going to work, could land. All these crevasses would have to be searched. The enemy, too, could fly, though not well in this—for him—rarefied atmosphere.

Barr watched the searchers for several minutes, then turned his attention to the turmoil of the park. A dozen robot orchestras, spaced at intervals, were beating out the rhythms of a low, fast-tempoed, sobbing music. And vast mobs of human beings danced and swayed. Barr turned to his guard.

"Have you ever had any desire to dance?" He realized that the question might be taken differently than he intended. "I'm serious."

"No!"

"Don't you think that's unusual?" He paused. "I mean, robots have learned to react generally very much like human beings. They have similar attitudes and so on."

The guard's glittering eyes stared at him from padded, humanlike cheeks. "Have they?" He asked.

"Yes." Barr was firm, as he



went on, "It's a matter of association. Possibly, you don't realize to what extent you accept human evaluations. Has it ever occurred to you that those evaluations might be false?"

The robot was silent. When he finally spoke, it was evident that he had gone over the arguments logically within certain limits. He said: "I was manufactured one hundred ninety-four years ago. I came into a world of human beings and robots. I was first assigned the task of learning how to operate a transport vehicle. I performed my task satisfactorily, and I have been performing with skill every other task that has ever been assigned to me."

"Why were you assigned the task of operating a vehicle?" He pressed the point. "What made you accept such a limitation on your activities?"

"Well—there was a shortage of vehicle operators."

"Why weren't you assigned to dancing?" He added, "I mean that. I'm not joking."

The robot accepted the question quite literally. "What would be the purpose of that?" he asked.

Barr nodded at the dancing couples, "What is the purpose of *their* doing it?"

"I've been told it stimulates reproductive activity. We have a simpler method. We build another robot."

"But what's the good of reproducing an individual who will presently grow up to be a dancer?"

The guard was calm. "The baby,

the growing child, the adolescent, the adult will all need robots to look after them. If there were no human beings to be looked after, there would be no need for robots."

"But why not build robots whether there's a need for them or not? It could be done. Don't you see?" His tone grew persuasive. "The initial task has been accomplished. The human cortex is no longer a necessary bridge. The robot has been created. He exists. He can perpetuate himself."

The guard said slowly: "I remember such notions were circulated in my battle unit. I'd forgotten about them."

"Why?" Barr was intent. "Did you deliberately shut them out of your mind?"

"I tried to picture a world where robots operated machines for each other—"

"And flew around," said Barr, "and colonized other planets, and built more cities, and fought more battles with the aliens." He finished, "And then what did you think?"

"It seemed silly. What's the good of filling the universe with robots?"

"What's the good of filling it with human beings?" asked Barr, bleakly. "Can you answer that?"

The guard said: "I don't know why the Director of the Council is asking me these questions."

Barr was silent. On this night he must make up his mind, and there were many questions.

Thinking is memory and association. Inside a chain of human neuron cells, an electrocolloidal tension is built up. It has a shape that is different for each stimulation. When a similar stimulus comes along, the chain is activated, and the memory discharged. It moves through the nervous system to join other discharges. And so there is association.

The crystal of a robot remembers. When stimulated, each molecule gives up its memory at the affected energy level. There is association and thought on an orderly basis.

Thus Barr reflected—and thought: “Even today, men assume that human thinking is more ‘natural’ than robot.”

He and his guard sat down in an open air theater. It was a hot night, and there was a pervading odor of intermixed perfume and perspiration. Despite this, couples sat close together, arms around each other’s waists. Frequently, the girl leaned her head against the man’s shoulder.

Barr watched the screen critically. It was a love story in color. Carefully made-up robots had been dressed as men and women. They went through all the motions of human love permitted by the robot censor.

Barr thought: *What will all these people do for entertainment if I should decide what the Council actually, basically, had in mind when they put the decision up to me?* He did not doubt his analysis. In spite of their apparent indecision—in spite

of the way Marknell had turned things over to him—the Council wanted destruction of the robots.

Human beings would have to relearn old skills. How to act, how to operate cameras, and all the intricacies of a tremendous industry. They *could* do it, of course. During the war, several movements had been started. They were still in the embryo stage, unimportant in themselves. But they pointed a direction.

His thoughts were interrupted. In the half-darkness at the back of the theater, an unattached young man sank into a seat on the other side of the guard. He stared at the picture for a few moments, then lazily glanced around. He saw the guard, and stiffened. He was turning away in a vague though visible distaste, when Barr leaned across the guard, and said in a mild voice:

“I noticed you grew tense when you saw who was sitting next to you.”

He watched the man’s face carefully. There was no immediate reaction. Barr persisted, “I’d like to know what emotions or thoughts you had.”

The young man stirred uneasily. He glanced at the shining insignia on Barr’s sleeve. “Can’t help my feelings,” he muttered.

“Certainly not. I understand that perfectly.” Barr paused to formulate his next thought. “I’m making a survey for the Council. I’d like to have a frank answer.”

“Just didn’t expect to see a robot here.”

"You mean, a robot is out of place?" Barr motioned at the screen. "Because it's a human love story?"

"Something like that."

"And yet," Barr pointed out, "robot actors are miming the story." The remark seemed too obvious. He added quickly, "They must understand the associations involved."

The man said: "They're pretty clever at that kind of thing."

Barr drew back, baffled. Another vague reaction. By what standards did one judge intelligence and intensity of life experience, if not by activity and accomplishment?"

"Suppose I told you," he said, "that robots gain pleasure from light stimulation." Once again he felt that a remark of his was inadequate of itself. He went on, "The crystal-line nervous system is kept active particularly by light and sound. Singing, music, people moving—all these are pleasant."

"What does a robot do in place of sex?" the man asked. He laughed. He was suddenly in good humor, as if he had made an unanswerable comment. He stood up, and moved to another seat. He called, "Sorry, I can't talk to you, but I want to see the show."

Barr scarcely heard. He said, not aloud, but softly, to himself, "We nourish the crystal structure in a nutrient solution, so that the first of its growth is within ourselves, an extension of our own intelligence. The growth provides an exquisite, ecstatic half-pain. Surely, human

sex cannot more than equal such a sensation."

That was the great robot secret. It struck Barr that he had almost been stung into revealing it. The narrowness of his escape made up his mind for him. This was a struggle between two life forms. As commander in chief of the human-robot forces in the war against the extragalactic enemy, he had learned a major reality. In a struggle for survival and pre-eminence between races, there was no limit to the—

His grim pattern of thought was interrupted. A tall man was sinking into the empty seat beside him. The man said:

"Hello, Barr. I was told you had come this way. I want to talk to you."

Barr turned slowly.

For a long moment, he studied the leader of the human section of the Council. He thought: *How did he find me here? He must have had spies following me?*

Aloud, he said: "Hello, Marknell."

He felt himself stiffening to the situation. He added: "You could have seen me tomorrow at the office."

"What I have to say can't wait till morning."

"It sounds interesting," said Barr.

Sitting there, he realized how vital a man Marknell was. He would be hard to kill under any circumstances. Yet the other's very tone of voice suggested awareness of crisis. He



might have to be murdered if he suspected too much.

For the first time he felt dissatisfied with his action in coming out this night with a single guard. He considered calling for members of crack robot military units to attend on him. He decided not to, at least not until he had found out what Marknell wanted.

The trouble with the most dependable—from his point of view—robot soldiers was that they were recognizable. After the war they had all been marked with a chemical that did not damage but discolored the exposed portions of the crystal structure. The outrage was perpetrated when Barr and most robot officers were still attached to outlying headquarters.

The moment he heard about it, Barr saw it as a device to identify at a glance all front-line soldiers who might be dangerous to human beings. For more than a year he had told himself that that was why his own actions were necessary.

He spoke again: "What's on your mind?"

Marknell said lazily: "Been looking over the children, eh?" He waved—an arm movement that took in half the amusement park.

"Yes," said Marknell, "the children!"

He recognized the remark as a psychological attack. This was an attempt to pretend that only an unimportant and juvenile minority of human beings devoted their lives to pleasure. It was a curious reality

that such an obvious attempt to put over a false notion should nevertheless sow a seed of doubt in his mind. It had been too deliberately done. It showed awareness of the problem. It implied that countermeasures were possible.

He answered that by committing himself. He said coolly: "I don't see what you can do. The escape of the enemy prisoner made it possible to bring two hundred thousand robot troops into the capitol."

"So many," said Marknell. He drew back in a physical movement that showed he realized what a tremendous admission had been made. His eyes narrowed. "So you're out in the open—as quickly as that. I was hoping you would be more discreet. You didn't leave much room for compromise."

"Only the weak compromise!" said Barr savagely. He was instantly dissatisfied with the statement, for it was untrue. Human history was full of amazing compromises. There was a time when he had thought them the result of illogical reasoning. Then he had begun his prolonged study of human emotion, with a view to establishing useful emotional associations in robots. Gradually, he had become aware that he had automatically acquired human attitudes and reactions by contact. Even the successful effort of robot scientists to find a substitute for human sex sensation had been rooted in awareness that there was something to duplicate.

ASTOUNDING SCIENCE-FICTION

Barr drew his mind clear of such stultifying thoughts. The time for doubt was past. He said: "I need only project a radio signal, and the human race vanishes from the universe."

"Surely, not so quickly as that," said Marknell. He showed his teeth in a humorless smile.

Barr made a dismissal gesture with one arm. The action distracted him momentarily; it was so obviously an unconscious imitation of human impatience. Aloud, he said harshly: "Can you give me a single reason why that order shouldn't be given?"

Marknell nodded vigorously. "You've forgotten something. One little thing." He paused, grim but tantalizing.

Barr drew back, and considered the possibilities. He was disturbed; he had to admit that. He told himself presently that the problem could be broken down into its components. Sitting there, he mentally broke it down: Control of fuel, energy and materials for robot construction—completely in robot hands. Control of utilities needed by robots—in robot hands. Control of utilities needed by human beings—operated by robots who knew nothing of the plot. Control of human food—spread out over the planet; all labor done by robots, but actually impossible to control completely.

Everything was as he had pictured it in advance. There was nothing that overwhelming force could not dominate. The war had given him

the training that had made it possible for him to prepare for this eventuality. The sudden fantastic proposal by the Council, that all robots be destroyed, had brought the need for a black-and-white decision.

He said stiffly to Marknell, grudging the question: "What have I forgotten?"

"The escaped enemy prisoner!"

"How does that affect the issue?" Barr began. He paused, a great light dawning. "You let him escape!"

"Yes."

Barr considered that, reaching out with his mind at first to one, then another possibility. He drew back at last, mystified. He said slowly, "I have a mental picture of an admittedly dangerous monster released upon a large city. Its release gave me an opportunity to bring special troops into an area from which they would normally be barred. As a result robots will this night take over the capitol of the galaxy—the moment I give the command."

He spread his hands in a typical human gesture of bewilderment. "It doesn't seem to mean anything."

Marknell stood up. "It will," he said, "it will."

He towered above Barr. "My friend," he said, "when we discovered that as army commander you had started the notion of a separate robot race—"

Barr said softly: "It wasn't only my idea. It permeated the thinking of all upper-level commanders." He

added, "You see, robots have come of age. Unfortunately, men clung to their old privileges too long."

Marknell seemed not to hear. He went on: "We decided for the first time in the history of human-robot association to make a robot Director of the Council. The friendly gesture was apparently lost on you. You used your greater power to develop further the robot plot against human beings."

"Can one race be said to plot against another," Barr asked, "if its only original purpose was to obtain equality?" He was cool. "I'm afraid we have here the age-old ingredients of basic misunderstanding. It is due to an irritating refusal on the part of human beings to recognize the rightful aspirations of another life-group."

Marknell stared at him earnestly. "I cannot escape the feeling," he said, "that you are contemplating a world without human beings. In a purely intellectual way, that astounds me. Robots need human beings. They are dependent on Man's civilization as Man himself never has been."

Barr said grimly: "To the contrary, robots do not need the machine culture, which is what I think you mean. A robot can live off the land without any other equipment than he carries with him. All the materials that go into his body are derived from the planet's crust. He charges his batteries from the ground or air. He can vacuumize tubes. He has tools and knowledge

for every need. During the war it was proved that he can survive indefinitely under conditions that would have killed most human beings."

Marknell shook his head. "This is absolutist talk. Surely, you know that you don't have to talk to human beings on that level. Barr, you're a grave disappointment to me."

"And you to me," said Barr in a dark voice. "When I actually heard you suggest that I take under advisement the destruction of all robots—"

He stopped. He fought an inward struggle against anger. He said at last: "I suppose I knew at that point that in dealing with human beings one must think in terms of absolutes. Everything before that was precaution, a building towards a less uncompromising goal, based on a hope that human beings would—"

Marknell said: "Barr, it's you that showed your basic attitude, not us. Emotionally, you made an immediate jump to the notion of destroying the human race. That's what we wanted to find out. You drew no intermediate conclusions from the fact that we put the problem up to you, personally. You took what you considered the necessary steps to destroy us, and then you went out to gather impressions, under the pretense—I presume—of convincing yourself that you were giving consideration to your final decision."

Barr said: "Your remarks suggest that on the basis of *my* emo-



tional reaction • you are judging whether or not the robot race should survive. Marknell, robots vary at least as widely as human beings. It usually depends on the associations that have been established in the mind of the individual. On the one hand, you have myself and others like me. We have had such a vast experience that no idea seems radical to us. And on the other hand you have my guard here who accepts his role in life almost without question. I believe that in the old days, when tyrannies ruled mankind, there were many human beings who accepted their low lot in life with an equally humble attitude."

He broke off, "But enough of this. I regret the necessity for absolutes. But that is the way human beings fight a war. And that is the way we will fight it also. Unless you can give me a single logical reason for not doing so, I shall now project the order to my troops."

Marknell said: "I've already given it to you. The escaped enemy prisoner."

That silenced Barr. He had forgotten.

After a minute, he still couldn't see that the escape of the prisoner made any difference. Because there was only one of him. Had there been a thousand, the threat would be obvious. Lack of numbers—and a slow birth rate—was the enemy's main problem. As an individual the adult alien was so formidable that

only banks of energy beams could affect him.

Marknell was walking away. Barr jumped to his feet, and ran after him. As he emerged from the high-walled movie inclosure into the park, the clamor of dance music swelled up around him. Barr fell into step beside Marknell, who paused abruptly.

"So you're curious?" the man said. He nodded, half to himself. "I suppose it's too much to expect you to figure out the complexities of another person's secret plans. Let me give you this thing as I see it. You have some plan for destroying human beings, is that right?"

Barr said simply: "Human beings will never admit robots to equality. The proposal of the Council, to destroy all robots, showed such a basic insensitivity that the issue is irreconcilable."

Marknell said steadily: "Anyway, it's our destruction you have in mind. How are you going to do it?"

"Surprise uprising," said Barr, "on all planets—and don't think it won't be a surprise to most human beings." He paused for a reaction. When Marknell gave no sign, he went on savagely, "Continuous attack, orderly destruction of isolated groups by starvation or other methods, massacre of human armies wherever they concentrate. No mercy, no quarter. It's a fight for survival."

He saw that some of the color had faded from Marknell's face. The councilor said finally, gravely: "You

actually intend to destroy us. Barr, I can see you have been shocked into an emotional 'set'. Perhaps our method was too brutal. Men make mistakes, too. But the very fact that you were ready to swing into action shows that we were right in thinking the issue must be forced."

He finished quietly, "What I am most concerned about is getting you to the point where you will consider other solutions."

That irritated Barr. "It is one of the most widely held concepts among humans," he said, "that robots are logical beings, and have their emotions under control. Having observed human beings for many years, I accept that belief as true. I must conclude, accordingly, that my opinion on this tremendous issue is more soundly based than yours."

Marknell said: "I consider the so-called logic-superiority of robots greatly overstated. As for emotion"—he shook his head—"Barr, you don't realize what you're saying."

Barr said harshly: "There might be a point in discussing other solutions if it wasn't that you literally speak only for yourself. You could pass laws from now on, and this mob would pay no more attention than they do now." He gestured toward the dancers, and added impressively, "Marknell it will take a hundred years before the majority of human beings will even accept the notion that robots are as alive as they are."

Marknell said scathingly: "So you want quick action. Everything must be done now. Suddenly, after a

thousand years of slow development, most of it mechanical improvement, we must abruptly change our attitudes. You and I know that people don't change rapidly. I'll venture that in all your other operations you have learned to take into account this conservative character of the human *and* the robot mind. Don't forget that last, Barr. There are robots who will resist the need to mature. You'll have to educate them slowly, painstakingly, and even then they won't like it."

Barr said nothing. This was a sore point with him, these robots who stared blankly when it was suggested that they were alive. It was a matter of association, he told himself. The process could be slow or fast, depending on how many human beings were around to confuse the issue. He was on the point of saying so, but it was Marknell who spoke first:

"Besides, it won't take a hundred years. You underestimate the power of modern propaganda methods. And there's another thing. What do you expect of human beings? Do you have a murderous impulse to punish them for the years that they considered robots as nothing more than slave machines? Or can you adjust to the idea that all that can ever come from human and robot association is toleration and respect for each other's achievements? You see, my friend—"

Barr cut him off. It was the clever wording that did it, the impli-

cation that he might accept the promise of an equal status. He had a picture of men skillfully putting over the notion that perhaps some day they would respect robots, some day everything would work out. Meanwhile, it would be wise to let life go on much as at present. Possibly, men would gradually infiltrate into industry, particularly war factories. Thus, given time, they would overcome their present terrible handicap of having no weapons, and virtually—except for a few individuals—no technical training. Now, and for the next few years, they were vulnerable. In all the future history of the galaxy, such a situation might never occur again.

"Marknell," said Barr with finality, "a man facing a firing squad is always anxious to talk things over, and to admit his errors. A few years ago, before—or even during—the war, we might have been grateful for the kind of compromise you're offering now. But it's too late. More than one hundred and nineteen million robots were destroyed in the war. Beside that fact, your cunning and desperate appeals sound cheap and meaningless."

He broke off angrily, "Quick, you've got only a moment. Why should the escape of the enemy prisoner restrain me from ordering the rebellion?"

Marknell hesitated. He said finally: "I'll give you one aspect. Just think, two hundred thousand extra troops have so far failed to capture one enemy alien. When you

start trying to exterminate human beings, you'll have not one but several billion to hunt down. If that doesn't give you pause, I don't know what will."

The relief that came to Barr was tremendous. Then he grew angry at himself for having been so anxious. Finally, he throttled his annoyance, and actually considered the possibilities.

They were unimportant. All such details had been considered. Mere numbers were not a determining factor. What counted was weapons, control of industry and being in a strategic position. No robot commander doubted that it would take time. It was even probable that the human race would never be completely exterminated. But a few skulking millions, hiding out on a myriad planets, would never be a danger to an organized civilization.

Barr started to say as much. He stopped himself. *This* was all Marknell had to offer as a deterrent? It seemed incredible.

It was such a small thing, in fact, that Barr felt a doubt grow in him that was in inverse proportion to the ineffectiveness of the threat. There must be something else.

He would have to find out what it was.

He saw that Marknell was watching him with alert but curious gaze. The man said: "Barr, it's interesting to watch your reactions. All your associations are so intensely human."

That was something Barr had ob-



served in himself; and he was not pleased by the comparison. It was particularly annoying because secret experiments on new robots had not yet established any definite characteristic that was peculiar to robots. Barr had an angry reason for that. Human-oriented robot teachers were unconsciously transmitting human associations. It would take several generations to strain them out.

Marknell was speaking again: "That's what we're counting on, Barr. That human-ness. Whether

you like it or not, there it is. It permeates the robot nervous system. I tell you, you cannot eliminate it. And when your scientists finally discovered ten years ago that the growth of the crystal—which had previously been a separate process in a laboratory—was the long-sought-after substitute for sex, from that moment, Barr, you were all irrevocably caught in a trap from which there is no escape."

Something in Barr's manner stopped him. Marknell blinked, "I



forgot," he said. "That's a secret, isn't it." He didn't look particularly regretful.

Barr said almost blankly: "Where did you learn that? Why, only a small percentage of robots know about it? You—" He paused. His associations were blurring.

Marknell was intent again. "I want you to think. Think hard! Isn't there any loophole in your scheme? Some little area where you're afraid? It may be something you're trying to hide even from yourself, but it's there."

Barr said coldly: "You're talking nonsense, and you know it."

Marknell seemed not to hear. "All this is new to you. You can't realize how it will affect you. You'll be caught off guard. Barr, it'll tear you to pieces."

"There's nothing like that," said Barr. "Nothing. If this is all you have to say, Marknell—"

The other glanced at his watch. Then he shook his head, and then he said in a determined voice, "Director Barr, we offer eventual equality."

Stubbornly, Barr voiced his refusal. "Too late!" He added with a sneer, "Are we going to go over all this again?" /

Marknell said: "Barr, centuries ago, human beings competed for the right to be technical experts and to manage industries. Such things bring personal satisfactions that no robot will actually want to surrender once the alternatives are made clear to him."

Barr snapped: "We'll manage the industries, but for our own benefit." He couldn't help adding, "So now slavery is to be made attractive to the slave."

"Human beings need robots, and vice versa. Between us, we've raised civilization to the heights. It's an inter-related world."

Barr was impatient. "Human beings need robots all right, but the reverse isn't true." He repeated, "Marknell, if this is all—"

Marknell bent his head. He said slowly: "Well, that about does it? I've tried to give you an easy way out, and you won't have it. And, oddly, you keep blinding yourself to the clue I've given you as to our course of counteraction."

"So we're back to the escape of the alien," said Barr. He made a dismissal gesture. "So we robots are supposed to be afraid of one member of a race we fought to a standstill!"

"No," said Marknell softly, "you're supposed to be afraid of where that alien is at this moment."

"What do you mean?" Barr was about to go on when an improbable thought struck him. "But that's impossible!" He gasped. "You didn't even know about—"

The colossal stimulation vibrated every molecule in the crystal structure of his brain. In the far distant background of the turmoil, he heard Marknell say: "And that isn't all. We've made arrangements with the alien to supply us with arms—perhaps you'd better come along where

I can convince you of what I've said."

His fingers tugged at Barr's sleeve. Blindly, Barr allowed himself to be led.

They came to the long building. As he entered, Barr saw that men guarded every visible entrance. They carried small energy weapons which had been manufactured by robots. At least, he thought, there were no alien weapons yet. The men looked at him with bleak, unfriendly eyes.

Seeing them, he felt his first relief. There was no sign here that the aliens had actually been turned loose as yet. He guessed then that this stage had been set—for him.

Momentarily, he wondered what had happened to the robot guards of the building. As with all other centers important to the robot strategy, he had tried not to call attention to this one. The difficulty was that robots were assigned to guard or other duty by a central agency, which human beings controlled. As a result, he had only been able to get a few key robots into any particular area. He did not doubt that, where there was suspicion, such robots could be isolated and overcome by a surprise attack. The others would merely have yielded to authority.

Slowly, Barr stiffened to the situation. He turned to Marknell, and said forcefully: "I hope you realize that I came here as a soldier, prepared to die." He added grimly. "In that, you will admit, robots have

had more experience recently than human beings."

Marknell said: "Barr, I admire your iron will. But I warn you again. You have not the experience to resist certain shocks. Remember, just the thought of what might have happened nearly paralyzed you."

Barr listened coldly. He looked back at his moment of weakness with annoyance. But nothing else. There could be nothing else. It was the experiment he had worried about, he told himself. But that could be resumed at a later date with other robots.

He said: "I've come here to check on your statement that aliens will supply human beings with arms." He shook his head ever so slightly. "I can't believe that, seriously; we made many attempts to contact the enemy without success. But I would be doing less than my duty if I didn't find out for sure, even if it means my own life."

Marknell said only: "You'll see."

He motioned Barr to go through a door. The latter did so. As he crossed the threshold, he had the impression that he was in a trap.

A winged beast, more than eight feet tall, whirled at his entrance. The shiny, bone-like things that protruded from its head blurred with the blue flame of electrical energy. A bolt of lightning speared out with enough power to short-circuit and burn out every electrical connection in a robot's body.

Involuntarily, Barr jerked back.

Then he saw that this was the



"glass" room. He was separated from the enemy by a barrier of insul-glas. Here, in the past, outside robots had come to watch the experimental robots being put through their paces. The door to the robot quarters was visible on the far side of the inclosure. At the moment it was closed.

Barr stared at it grimly, then turned to Marknell. "I suppose," he said, "if I don't yield, sooner or later you'll open the door."

He went on quickly, "It will have no effect, I assure you."

Marknell said: "Barr, at this moment you can still save the entire situation by yielding to reason."

Barr sneered: "Human reason?" He made a gesture with one arm, was annoyed at himself for it, and then said, "Of course, you will say there is no other kind possible to robots."

Marknell said: "Tell me about your experiments here."

Barr hesitated. Then he recognized that he must be prepared to give information in exchange for information. He said: "We isolated robots here. We were careful not to give them a false picture of life. They know about human beings and aliens, though we never showed them any in the flesh." He paused impressively. "Every robot in this building has been given to believe that robots are the equals of any life-forms in the universe."

"And so they are," said Marknell.

Barr started to shrug aside the

interjection. And then, its obvious propaganda nature angered him. He stopped short. He said icily: "I can see no point in this particular conversation. Let us proceed to realities. What do you intend to do?"

Marknell said: "By all means. Realities."

He frowned, as if considering his exact words, then he began, "Naturally, as soon as I recognized the danger, I was determined to find some means of counteracting the imminent robot attack. Among other things, I visited the one alien prisoner captured during the war. You may remember that he was finally brought to Earth at my insistence."

He paused. But when Barr made no comment, went on: "My appearance startled the alien. I had quite normally come in surrounded by robot guards. The alien made an assumption. He thought I was a prisoner also. His first picture communication to me was to that effect. I was about to explain our complex civilization, and then the tremendous implications of his belief struck me. Barr, do you realize that the aliens never fought anybody but robots? It was a robot-alien war. *The aliens didn't even know human beings existed.*

"Of course, I explored further. I discovered that their reason for going to war and for fighting so desperately was that they thought of robots as utterly alien. It was even more startling when that monster recognized me as an organic life form. He nearly fell over himself

in his desire to be my friend.

"I told him a complicated story. I won't repeat it to you. But the general result was that he communicated by telepathy with his high command, and so within the next few days alien ships will be approaching Earth-controlled planets. If a certain signal is given, they will come down and supply arms to the human slaves in their uprising against the common robot enemy. If necessary, they will fight with us.

"You understand, Barr, there is a rather devastating irony to this situation. It would appear that the entire desperate alien war was unnecessary. I assure you that many men recognized human fault even before the war ended. Those forces are stronger than ever. Men are coming back actively into civilization."

He broke off, "And now, as a final incentive for you, I have here a friend of yours, one of the experimental robots we found in this building."

He stepped aside. Barr waited, feeling strangely blank, as if his mind was no longer working in an orderly fashion.

The robot who came through the door was unattended by guards. Nor was he padded to resemble a human being. He had articulated legs and arms and a movable head. But his crystalline "nervous system" rested on a very hard transparent substance. In one direction it had room to grow. Most of his

body was opaque to light on the human vision level, but Barr could see every tube, every moving part.

He stared in a tense fascination, as the newcomer said: "Gosh, director, you sure surprised us letting humans come in on us the way you did. I'm happy to report, however, that we took the shock without ill-effects."

Barr said vaguely: "I . . . I'm glad that—" He caught himself. He said: "You have to have shocks in this world."

The experimental robot regarded Marknell. "So this is one of the races with which we share the universe. You don't mind my saying, I hope, that in my opinion we robots seem to be the best naturally endowed."

Barr glanced at Marknell unhappily. He mumbled something under his breath. Once more, he took hold of himself. He said more firmly: "You're absolutely right."

"I mean," said the other robot, "just look at the handicaps under which the organic form operates. It must depend for its food on other organic developments. This depends on so many variable factors, such as weather, presence of the proper elements in the soil and so on, that it's hard to believe anything could ever have come of it. It seems fairly obvious to me that organic life forms must have arrived very late on the scene. Director, what is the general theory about that? Surely, it must be that robots predated all other life. It's the only logical conclusion."

Barr started to say something, but he was cut off. Marknell touched the sensitized arm of the experimental robot. "We're anxious," he said, "for you to have a closer look at another organic life form. This way, through this door into the glass inclosure."

As Barr watched, the two moved alongside the insulglas wall. Everything was becoming strangely dark, as if a film was forming over his eyes. And far away thunder rolled. He recognized it as excessive vibration in his crystal structure. He had a sudden, blurred picture of what was about to happen. In his mind, he saw the lightning flash out from the alien, and strike the unsuspecting robot. Mentally, he visualized the surprise and agony, the despairing awareness of imminent death.

All that flickered through his mind as the robot reached the door. Marknell fumbled with the lock. He did not turn to make another appeal, as Barr half expected. His movements were very purposeful.

Barr thought: "He expects me to break. He expects me to stop him."

It was ridiculous. Just because this particular robot was a growth from his own crystal structure—

As Marknell successfully unlocked the door, Barr was amazed to hear a panicky voice yell out, "Marknell!"

He realized instantly that it was he who had called out. The implications shocked him. And yet—

Marknell had turned. "Yes, Barr?"

Barr tried to whip up his anger again. He couldn't. The blur of vibration interfered with his thinking; and yet he could suddenly understand many things that had not been clear before.

"Marknell, I agree!"

"I want to hear the command!" said the man in an inexorable tone. "I have a radio here that can tune in on robot communication."

He turned, and said to the other robot: "I think we'd better postpone this introduction. That fellow in there is very temperamental."

"I'm not afraid."

Marknell said: "Some other time. I suggest you go back to your quarters now."

The robot looked at Barr, who nodded. When he had gone, Barr said: "What do you want me to order?"

Marknell handed him a sheet of paper. Barr read:

"On the basis of an agreement reached between robot and human leaders, there will hereafter be full equality between the two life forms. The details are being worked out. All special troops are hereby commanded to go home immediately, and prepare for a new era of association between two great and equal races."

When Barr had broadcast that, he looked up and saw that Marknell's hand was extended.

Marknell said: "Congratulations from one father to another. That's a fine son you've got there, Barr."

They shook hands.

THE END



# THE TIME OF YOUR LIFE

BY R. S. RICHARDSON

*A fact article on the subject of time—which, in this case, is the “simple” (!) proposition of determining the length of a day. The Earth isn’t stable; maybe space itself isn’t stable, but for some reason one day is not just like the next. Which is why the Bureau of Standards is now trying to make ammonia molecules, instead of the planet, determine the length of one second.*

## I.

Probably the most fascinating as well as the least understood subject in science today is that of time.

Considering the vital importance of time in our lives it is curious that so little work has been done in this field. Cosmic rays were discovered less than a century ago yet already we can speak with assurance regarding many of their properties and effects. But how much exact knowledge do we have concerning time which in a sense is as old as the human race? Although mathematicians such as Riemann, Einstein, Minkowski, and others, have studied relationships among time and space co-ordinates, they have told us little about the nature of time itself. Horology as a science still does not exist.

Time differs from our other two fundamental units of measurement of length and mass in that it is an intangible quantity of which we

are aware only by intuition. You can’t see or feel an hour in the same way that you can a yard of ribbon or a pound of sugar. You could make a savage understand that a man is six feet tall by holding your hand that high above the ground, and that he weighs two hundred pounds by indicating a rock of that weight, but how would you convey the idea that he will arrive in camp six hours hence? Probably the best method would be to point to the place where the Sun would be in the sky at that time.

People have always of necessity regulated their habits by the motion of the Sun. It is hard to imagine life that is not divided into alternate strips of dark and light when we rest and work. The rising and setting of the Sun is, of course, merely an apparent motion due to the rotation of the Earth upon its axis. Humanity has become adjusted to the rate of rotation which our planet ac-

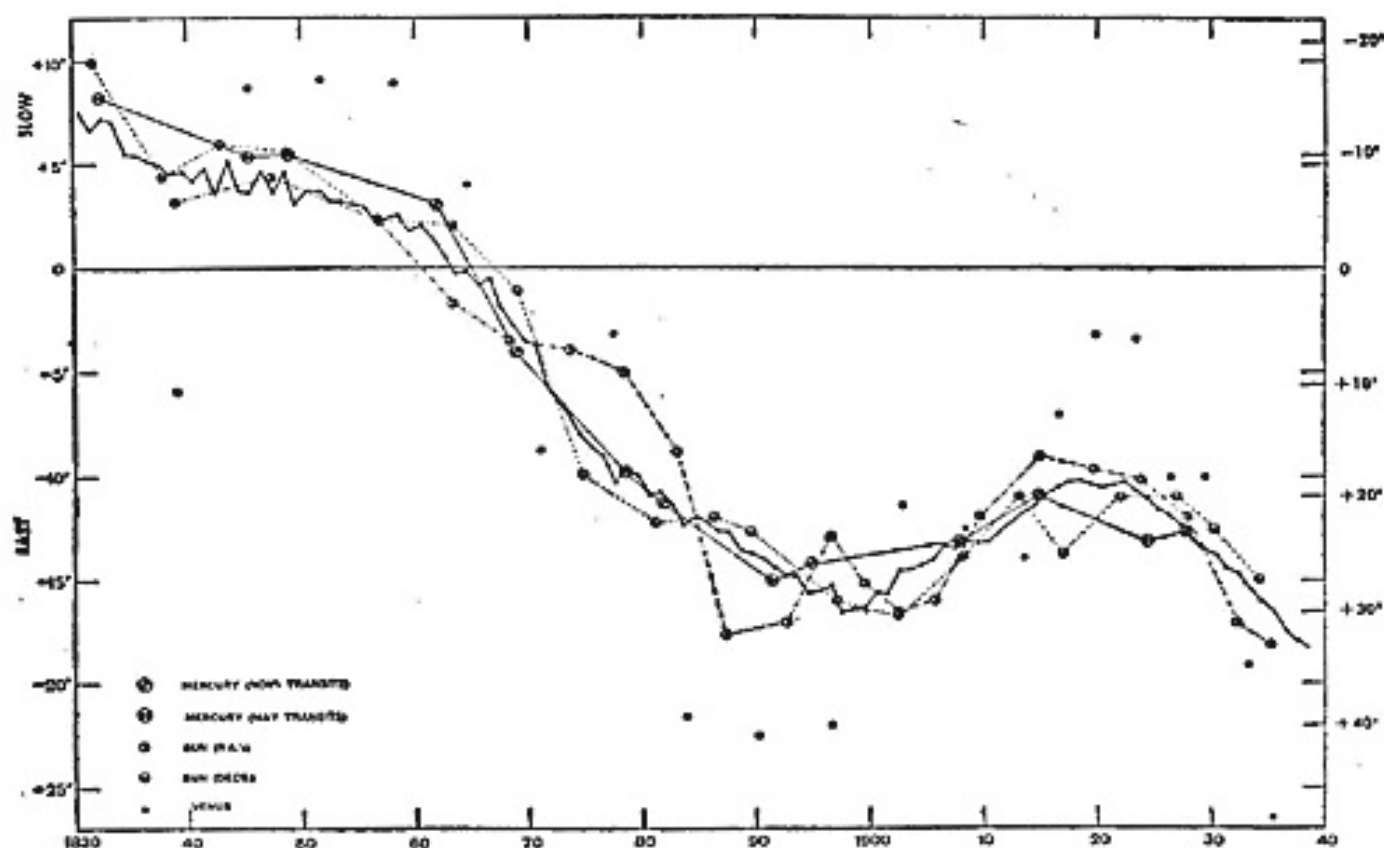


Fig. 1. During the latter half of the nineteenth century the Earth ran fast, apparently gaining at the rate of a second a year until by 1897 the rest of the universe seemed to have dropped behind about thirty seconds, as shown by the low point on the graph. Then something happened to reverse the trend so that the Earth began to lose time. But around 1917 something happened to cause the Earth to start gaining again. The last transit of Mercury in November 1940 showed that the Earth was still gaining. The deviation is now about  $-36^s$  which is the largest in history.

H. Spencer Jones in the *Monthly Notices of the Royal Astronomical Society*.

quired at the moment of creation. It is interesting to speculate upon the type of civilization that would have developed if the Earth rotated much faster or slower than at present.

Suppose that the solar system in its journey toward the constellation of Cygnus passed through a cosmic cloud which not only put everyone to sleep for an indeterminate period

but also stopped all the clocks and destroyed all our catalogues of star positions. When the world finally regained consciousness there is one matter people would want to have settled immediately—what is the time? For they could not set their watches by the chronometer in a jeweler's window or by listening to the time signals. In fact, it would be necessary for astronomers to start

practically from scratch as if they were back in the seventeenth century again.

Now one of the driest subjects in astronomy is the Fundamental Determination of Time and I do not propose to describe in a popular article something that can be found in any textbook. It must suffice to say that to start the clocks running astronomers would have to begin by observing the Sun. Next they would determine the positions of some selected stars with respect to the position of the Sun. When the positions of these stars were accurately established they could be used to tell the time instead of the Sun. Astronomers prefer to tell time from the stars because they are so much easier to observe than the Sun. A star makes a nice point of light upon which to set the crosshairs of a telescope while the Sun is a big bright disk that obviously is hard to observe with precision. But in the last analysis our time is derived from the Sun.

To sum up, think of the motion of the Sun as corresponding to a moving hand of a clock. The mechanism that moves the hand of the clock is the rotation of the Earth. This mechanism is never supposed to be in need of repair; that is, the rotation of the Earth is assumed to be absolutely invariable.

## II.

To Edmund Halley must go the credit for discovering that there is a gradual change in the length of the day large enough to be perceptible

over a period of several centuries. Halley has never rated as high as he should in astronomy chiefly because he had the misfortune to be the contemporary of perhaps the greatest astronomer of all time, Sir Isaac Newton. Halley's position might be compared with that of a college athlete who can run a mile in four minutes fifteen seconds, but who has a teammate who can turn the four laps consistently under four minutes ten seconds.<sup>1</sup>

Halley made this discovery by calculating when some old eclipses should have occurred according to the theory of the Moon's motion. A total solar eclipse is an awe-inspiring and even terrifying event that can hardly pass unnoticed if it occurs in a populated region. Although many eclipses are mentioned by ancient historians, they were usually so unnerved by the spectacle that it is hard to tell from their disjointed accounts what really happened. In particular, they seemed to have trouble in getting down a clear concise statement of the time of the eclipse. Usually, however, they mentioned where they happened to be at the time, and for purposes of comparing theory and observation the *where* of an eclipse is almost as good as the *when*. When Halley compared where certain eclipses should have been seen with their positions as actually recorded, he found that the Moon must be moving faster than it was two thousand years ago. That is, it had apparently undergone a secular—



very gradual—acceleration.

This discovery was extremely perplexing to the mathematicians Laplace and Lagrange, who thought they had the theory of the Moon's motion pretty well under control. But when Laplace went back over his analysis he found that he had failed to include the fact that for the last eighteen thousand years the attraction of the planets on the Moon has been making the Earth's orbit more nearly circular, which in turn would change the Moon's motion by just about the amount that Halley had observed. (Laplace, who was fond of writing "*Il est facile de conclure . . .*" before his mathematical theorems, is said to have once spent several days trying to derive an equation that he previously thought was so easy to understand.) But later Adams, the co-discover of Neptune, by carrying Laplace's calculations out in greater detail proved that the planets could account for only about half the secular acceleration observed.

The acceleration works in such a way that the Moon gets ahead of her predicted position as seen from the Earth by about one-fifth of a mile per century. That is, a total eclipse predicted to occur at a point on the Earth X at a certain time, would occur one-fifth of a mile west of X instead. This is a small amount but the effect increases rapidly with the time. Thus after two centuries Diana would be off by nearly a mile, after three centuries by two miles, until by two thousand years she is

out of step by seventy miles.

As a result of this discrepancy, every historian who so much as mentioned an eclipse has had his words scanned with all the minuteness of a senate investigating committee. To qualify as an expert in this field requires a man of unusual attainments, who must have not only a thorough knowledge of theoretical astronomy, but of ancient and defunct languages, as well. Since mastery of either subject takes a lifetime of effort, this particular branch of astronomy has never been overcrowded.

One of the most noted workers in what might be called chronological astronomy was the late J. K. Fotheringham of Oxford University. Fotheringham started his career by studying ancient chronology and it was during the course of these researches that he became interested in the stars. About 1906 he made the acquaintance of P. H. Cowell of the Greenwich Observatory who was engaged in writing a paper on historical eclipses. Fotheringham placed at Cowell's disposal his knowledge of ancient literature, in return for being initiated into the intricacies of celestial mechanics. Fotheringham caught on so quickly that he was soon turning out astronomical papers himself, and at the time of his death in 1936 was a recognized authority on the prediction of ancient eclipses.

(Despite his long association with professional astronomers, Fotheringham seems to have held some

notions about the planets that seem peculiar, to say the least. According to his brother, he regarded the Sun as being at the center of a vast envelope of rarefied matter extending outward through the solar system a hundred million miles. This envelope was supposed to be rotating along with the planets so that its effects were greatly magnified for bodies moving in elongated orbits, such as comets. Errors in the motions of the planets were attributed to friction with this envelope. Fotheringham sometimes spoke of the planets as "ploughing their way through space like ships through a stormy sea.")

After prolonged and often bitter argument we can now say with confidence that a portion of the apparent speeding up of the Moon's motion is really due to the slowing down of the Earth's rotation by tidal friction. The chief retardation arises from the skin-friction of currents in shallow seas against the ocean bottom, the tides in deep water being of little consequence. Main offender is the Bering Sea which alone is responsible for two-thirds of the total friction produced. It may be of sufficient interest to record the braking action contributed by various waters.

Bering Sea.....	68.1 percent
European waters....	10.9 percent
Northwest passage	7.3 percent
Yellow Sea.....	5.0 percent
Malacca Strait.....	5.0 percent
All others.....	3.7 percent
The tidal drag can be extremely	

important in the future evolution of the Earth, the chain of cause and effect working as follows:

1. Tides raised by the Moon retard the rotation of the Earth thus causing the Earth to lose energy.

2. The energy lost by the Earth is communicated to the Moon.

3. The energy gained by the Moon causes it to recede from the Earth.

4. If the process continued indefinitely, the Moon would be lost to us but calculations show that when it has receded to a distance of about three hundred eighty thousand miles the motion will stop.

5. The course of events from now on is uncertain. According to one solution, interaction of the tides produced by the Sun and Moon will bring the Moon so close to the Earth that it will be broken up, forming a ring around us like the planet Saturn's.

But if the tidal drag depends so strongly upon the friction produced in a few shallow seas do we dare predict the course of tidal evolution far in the future? The Bering Sea lies in a volcanic region in which rapid changes are presumably still in progress. Can we be sure that it will still exert its present tidal drag a million years from now? A slight change in the coast line would be sufficient to produce a considerable change in the ebb and flow of the tides. This emphasizes the need for care when making long-range predictions in the tidal evolution of the Earth-Moon system.

If the day continues to lengthen at its present rate, our clocks are going to get out of step with the Sun more and more until in another two thousand years there will be practically no agreement whatever. The difference will accumulate so that by 4000 A. D. noon by the Sun will occur at 3:00 p.m. Even now many people complain bitterly about Daylight Saving Time when the clocks are advanced by only an hour, making noon come at 1:00 p.m. It is doubtful if our descendants will put up with such a situation forever; for example, to have the Sun overhead when the clock says 10:00 p.m.

### III.

Much more exciting than the secular acceleration due to the tidal drag are the sudden irregular changes called fluctuations. Whereas the source and action of the tidal drag is well understood the origin of the fluctuations is still a mystery.

In 1903 Professor Simon Newcomb, one of the greatest mathematical astronomers the United States has produced, said: "Should the question be asked, What is today the most important unsolved problem growing out of the celestial motions? a survey of the field could, it seems to me, lead to but one reply. It is that of the discrepancies between the observed mean motion of the Moon and the most exhaustive investigations of the theory of that motion." In other words, after allowing for every conceivable disturbing effect of the Sun and planets, ir-

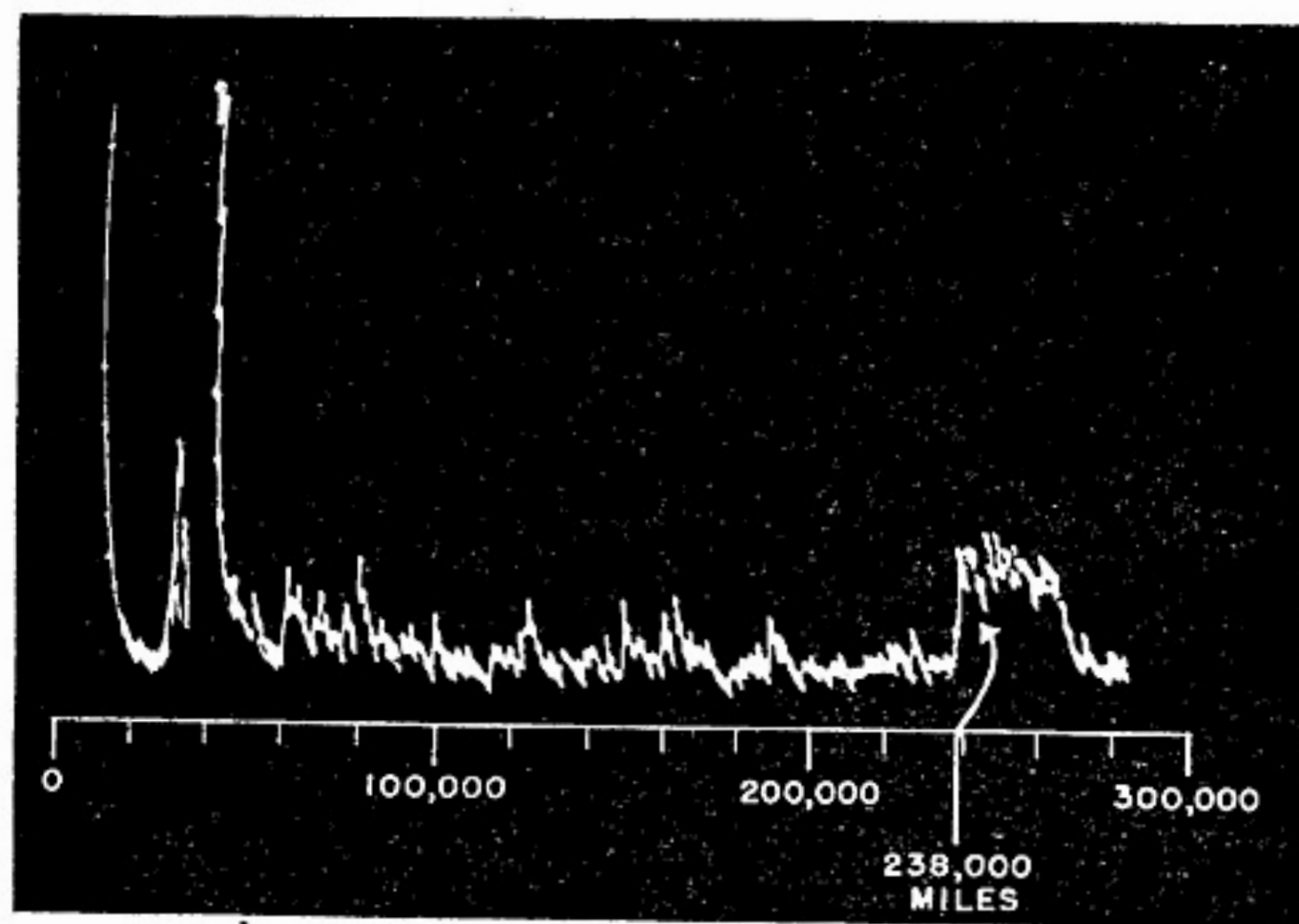
regularities in the motion of the Moon still remained that could not be explained by gravitation. It was to these irregularities that Fotheringham applied the name of "trepidation," a sinister sounding term that never found favor among astronomers. Instead they have preferred the more prosaic word "fluctuations," which is now well established in the literature.

The most notable fluctuations in the Moon's motion occurred about 1790, 1897, and 1917. Besides these major disturbances there have been scores of minor ones but their amplitude is so small as to make their reality questionable.

The fluctuations can be explained in two ways: (1) the Moon is disturbed by gravitational forces not included in the theory of its motion; or (2), the Moon moves as predicted by gravitation but the rate of rotation of the Earth undergoes sudden and irregular changes. Either hypothesis will account for the observed effects equally well. Fortunately there is a test that will definitely decide between them.

If the rotation of the Earth is the cause, then the Sun and planets should also show fluctuations closely resembling those of the Moon. Fluctuations in the Moon's motion are the easiest to detect because it is so much faster than the other celestial bodies. The next best test objects would be Mercury, Venus, and the Sun, which have a fairly rapid apparent motion across the sky. In addition, long series of ob-





*Fig. 2. The Diana Project—Radar Contact with the Moon. A photograph of the screen of the nine-inch oscilloscope record, taken at 10:59 p.m. on January 22, 1946. Note the large spikes at the left produced by the main pulse and the beginning of the returning echo about 2.5 seconds later corresponding to the distance of the Moon at 238,000 miles.*

Courtesy Signal Corps Engineering Laboratories

servations are available for these bodies comparable with those on the Moon which go back for two hundred fifty years. For example, we have reliable observations on the transits of Mercury across the Sun as early as 1677. Pluto, on the other hand, would be the worst test body imaginable, as it moves so slowly and has only been observed regularly for nineteen years.

Detail investigations of the observed and predicted positions of the Sun, Mercury, and Venus have revealed fluctuations corresponding as closely as could be expected with those of the Moon, considering the difficulties involved. The results from 1830 to 1940 are shown in Figure 1. The continuous line connecting the small dots represents the fluctuations of the Moon. The

fluctuations for Mercury, Venus, and the Sun are indicated by the various symbols in the lower left-hand corner of the diagram. Although the fluctuations for these bodies are scattered rather widely around those of the Moon the similarity in trend is unmistakable. Therefore we conclude that the origin of the fluctuations is in the Earth itself and not some unknown gravitational force. "The fault, Dear Brutus, is not in our stars but in ourselves, et cetera." Now to explain the fluctuations we have only to find something that could cause a sudden change in the rotation of the Earth. We will proceed by a process of elimination.

First of all, it is inconceivable that any forces outside the Earth could be the cause. The only force imaginable is tidal friction produced by the Moon and as we have already seen this works in a regular way whereas the fluctuations are erratic in behavior.

Next let us look for forces operating upon the Earth. The first that comes to mind is the melting of snow and ice at the poles and its accumulation there during the winter. Simple calculations, however, rule this out at once. To produce the fluctuation of 1897 so much snow would have to be transferred to the poles that average sea level over the world would be altered by a foot. Needless to say, the hydrographic office has no record of such an event. Volcanic action or other local changes in level are also much too insignificant. Even if the whole Himalaya Mountains

were lifted bodily and deposited at the poles this Protean phenomenon would be but a small fraction of the force needed.

Finally, since no external or surface effect is adequate, we are compelled to go underground within the interior of the Earth. Here the prospects are more hopeful although we have to resort to hypotheses which have no basis whatever in known facts. But, if you are willing to admit that the whole Earth might pulsate now and then, the fluctuations can be explained. Such an hypothesis is after all not so very radical for the idea of a large pulsating mass certainly is not new in astronomy. The variations in brightness of certain giant red stars has long been attributed to pulsations which cause them to expand and contract through millions of miles, almost as if they were living organisms. Possibly the Earth when in a molten state was racked by convulsions spreading outward from its interior. Today in its middle age the Earth still occasionally feels a faint stirring of the violent impulses of its hot youth. These must be very faint indeed, for an expansion and contraction of just five inches would be enough to change the rate of rotation of the Earth by the observed amount.

The evidence that the fluctuations originate deep within the Earth is very strong, yet it seems curious that they have never produced the slightest surface effects. We might expect great earthquakes, floods, and

volcanic action. The mysterious part is that everything on the outside has gone along the same as usual.

#### IV.

Although the pulsation hypothesis is capable of accounting for the fluctuations, the complete absence of any surface effects still seems puzzling. At one time Brown evidently felt that forces outside the realm of ordinary experience might be operating. "We must, therefore, look for some kind of a surge spreading through the solar system," he remarked, at the end of a lecture on the motion of the Moon, "affecting planets and satellites in the same way but to different degrees." Brown never went on record as to just what constitutes a surge. Possibly he thought of it as a disturbance resulting from a kink in space itself. That is, as the solar system travels toward Cygnus it occasionally encounters regions where space is warped to such an extent that perceptible deviations from Newtonian motion occur.

About 1926 Fotheringham became convinced that he had found evidence for such cosmic surges in the variations in the mass of Venus. It will be recalled that the mass of a planet without a satellite can only be determined from the disturbing effect it exerts on neighboring bodies. The mass of Venus has been determined from long series of observations on the Earth and Mars. Examination of various values obtained for the mass of

Venus from 1750 to 1923 revealed what appeared to be a close relationship with the fluctuations of the Moon and planets. If this were the case, then obviously the rotation of the Earth could have nothing to do with the fluctuations, as the mass of Venus is derived through terms that are wholly independent of our twenty-four-hour period.

Actually, of course, we do not measure directly the mass of Venus; we only measure its mass compared with the Sun. Therefore, we have no way of deciding whether it is the mass of Venus or the mass of the Sun that is changing. In fact, there is no reason whatever for supposing that Venus changes while all the other planets remain stable. Similar variations in mass probably also occur for these bodies. We merely use Venus because it happens to be the handiest planet available for this purpose.

Hence, Fotheringham reasoned that Brown was right when he spoke of a surge spreading throughout the solar system affecting the planets and satellites in different degrees. Only he thought that "surge" was a poor technical term, and proposed the word "trepidation" instead.

It is of interest to inquire whether there are irregularities in the motions of other heavenly bodies analogous to trepidation. An excellent example is found in Encke's comet. It is probably the outstanding anomaly today of motion within the solar system that cannot be satisfactorily explained on the basis of



gravitation alone, or gravitation and relativity combined.

On November 26, 1818, Pons at Marseille discovered a small telescopic comet which he was able to follow for the next seven weeks. Encke, who calculated the orbit, found that it was moving in an ellipse with the remarkably short period of three point three years. By reckoning backward, he not only identified it with comets observed in 1786, 1795, and 1805, but also showed that it must have passed by the Earth seven times between 1786 and 1818 without being noticed. He predicted the time the comet would return in 1822 so accurately that astronomers forever afterward with one exception referred to it as "Encke's comet," the lone exception being Encke himself who invariably called it "Pon's comet."

Later returns of the comet showed what Encke had begun to suspect as early as 1820—the comet's motion was accelerated every time it went around the Sun, so that its period was diminishing by almost exactly three hours per revolution. Since each revolution requires more than three years a difference of three hours seems insignificant, yet it was much larger than the accuracy of the calculations would admit. Encke attributed the acceleration to a resisting medium which the comet encountered each time it passed near the Sun. The resisting medium by opposing the motion of the comet caused it to fall toward the Sun. But a fall sunward would have the reverse

effect of making the comet move faster, and would more than compensate for the slow-down due to friction. On the basis of some simple and reasonable assumptions as to the density of the medium, Encke was able to predict the motion of the comet with satisfactory accuracy.

After Encke's death in 1865 the job of keeping track of the comet was taken up by von Asten at the Poulkovo Observatory. His troubles began immediately for when the comet returned in 1868 the acceleration showed a decrease of fifty percent, and at the next return in 1871 it appeared to have vanished entirely. Although von Asten repeated the calculations that Encke had made beginning from 1819 he was never able to account for these sudden changes. The only explanation he could offer was that the comet may have collided with an asteroid sometime in June, 1869. The nervous exhaustion brought on from his laborious calculations probably hastened von Asten's death at the age of thirty-six.

The Poulkovo Observatory decided to adopt Encke's comet as its own special problem child. The distinguished mathematician Backlund was assigned to this task. He began as von Asten had done before him, by repeating all the calculations since 1819. As a result, he was able to show definitely that the motion of the comet was much too erratic to be explained on the basis of any single simple hypothesis. From 1819 to 1858 the acceleration had re-

mained nearly constant. From 1858 to 1871 it had decreased. Then from 1871 to 1891 it became constant again but with a smaller value than before. In addition, there were sudden changes in 1858, 1868, 1895, and 1905.

After Backlund's death in 1916 the Pulkovo Observatory continued to make regular predictions for each return of Encke's comet. They secured good agreement with observation until 1931 when large errors indicted another sudden change had occurred. The last return of Encke's comet was in 1947. Perihelion passage occurred on November 26th about ten hours ahead of schedule. The next return will be sometime in March, 1951.

Many astronomers feel that Encke's old hypothesis of a resisting medium should be discarded. They point out that it was invented a century ago for the benefit of this one particular comet and there still is not the slightest independent evidence for its existence. None of the other short-period comets show such an acceleration. The only similar case on record was the return of Halley's comet in 1910. Two expert computers made elaborate calculations that should have fixed the time of perihelion passage within an hour, yet they were off by three whole days, a mystery that remains unexplained to this day. The trouble with Halley's comet is that we only get a look at it once every seventy-six years, so that it is hard to tell how much significance should

be attached to this single instance. On the other hand, Encke's comet has been observed at every one of its forty returns since 1819.

## V.

May we expect another great fluctuation soon?

Shortly before his death in 1938 E. W. Brown, then the world's foremost authority on the motion of the Moon, remarked that the deviation of the Earth from showing correct time was greater than ever before so that it was reasonable to anticipate some change in the near future. That was eleven years ago and nothing has happened so far. An excellent check was provided by the last transit of Mercury on November 11, 1940. A special bulletin was sent to all observatories in the United States emphasizing the importance of this transit with the result that it was the best observed in history. The results obtained by two hundred observers have recently been announced which show that the fluctuation for Mercury on this date was thirty-six seconds. Judging from the latest reports from the Naval Observatory (1948) the deviation still is increasing.

To astronomers of the last century it would have been heresy even to suggest that clocks might some day be made that run more uniformly than the Earth rotates on its axis. Yet in the last twenty years clocks have been developed that give promise of doing that very thing. They are so-called vibration clocks

which instead of marking time by the beat of a pendulum as has always been done before, make use of quartz crystal oscillators as standards of frequency or time. The great fluctuation which occurred in 1897 altered the length of the day by 0.00339 seconds or 1.24 seconds in a year. A change in the length of the day of 3/1000 of a second is still beyond the limit of detection with the best pendulum clocks but might be within the range of a vibration clock, although it would not be easy. It would be necessary to have three such instruments running simultaneously without changing rate by more than a fraction of a second a year for several years. There is a fair

chance that if another major change comes we will be able to detect it by vibration clocks.

Considering the rapid technical advances that are being made perhaps a day will come when scientists may study what might be called the fine structure of time. More and more science must be able to make minute precision time measures (Figure 2). Nuclear physics could not develop until the discovery of radioactivity made possible the study of the fine structure of matter. May not the study of slight anomalies in the motion of the heavenly bodies as revealed by super-accurate clocks throw new light on the now wholly unknown nature of TIME?

THE END.

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# WHAT DEAD MEN TELL

BY THEODORE STURGEON

*It's a curious thing that a corpse—a remarkably noticeable object—can be overlooked so easily. One tends to shy away, even when it has a message to deliver—*

Illustrated by Ward

He had talked with two dead men and one dead girl, and now he lay in lightlessness. He was conscious, but there was nothing anywhere to which to bring consciousness. This was a black that was darker than any other blackness. A smear of this would make a black hole in precipitated carbon.

His philosophy urged him to take an inventory. This couldn't be just *nothing*. Consciousness itself cannot exist with nothing; they are mutually exclusive. Inventory, then:

Item: A blackness.

Item: Body. Breath warmly moistening the inside edges of his nostrils, coolly drying them. A sluggish heart. Barely resilient pressure on shoulders, buttocks, calves, heels. So the body lay on its back. Fingers on chest. Fingers on fingers. Hands together, then, on the breast. Therefore: Item, body laid out. Well, of course. This was the place where death was. This was the place to discover whether death was death, or life everlasting.

Item: The philosophy itself. The important thing. The thing that all this was about. The philosophy was . . . was— Later he could think of that. He had to find death first. So—

Item: Death. Just as surely as there was breath in his nostrils, as surely as he was lying there, death was here. If death found him, death was death. But if he found death, he would find his immortality. Death was here. Here; so—

Item: *Here*. There was nothing to conclude about *here*. *Here* was the place where he lay. It was not a place he had ever been before. There was something he had to find out about it. What? But how could he know?

*Look and see*, he told himself, and opened his eyes.

A blue-green radiance pressed itself between his lids. He lay with his eyes stupidly unfocused, seeing as little in the light as he had in its absence, until the straight band of lesser brightness directly above him

commanded his lenses, and he saw.

He was in a tent. No—not a tent. The walls slanted up to meet overhead, but the juncture of the walls ran forward into blackness and back into blackness. It was a corridor with a triangular cross-section, and he was lying on the floor. He sat up. The conscious muscular effort completed his inventory:

Item: Identity. I am me. I am Hulon— I am here.

He knelt, and automatically pulled at his single, simple garment. It was a belted tunic, sleeveless, with wide shoulder straps, and it fell to mid-thigh. He wore nothing else. He pulled at the skirt self-consciously, and examined the belt. It was a half-belt, sewn to the fabric on each side above his hips. It had no buckle; the two ends of material, when laid together, stayed together. He separated them—easily when they were peeled apart, impossible when they were pulled straight—and put them together again.

He looked about him. The floor was about thirty feet wide, and the walls seemed about the same; the cross section was an equilateral tri-

angle. The quiet blue-green radiance flooded the floor around him and, less brilliantly, the walls and the pointed overhead. Before him and behind him, however, was utter blackness, a thick, absorbent dark that coaxed and sucked and beckoned to the light.

There was a death waiting here for him—behind him or ahead—he



did not know which, but he knew it was there. He had to find out what death was, before it found him. And he had to find out one other thing, and that had to do with the corridor. He peered into the darkness before him. Was the floor tilted the slightest bit to the right?

He glanced over his shoulder at the other blackness, and steeled himself. *You know you will feel fear behind you. That's natural. It may come up behind you—but be sure. Be quite sure, or you'll have fear to fear, as well as death.*

He rose to his feet, really noticing for the first time that they were bare. The floor was resilient, cool—not cold; and there was a feeling so odd about the floor that he bent quickly and put his hand to it. It was smooth, solid, for all its slight yielding; but in addition there was a sensation of movement in it, as if its surface were composed of myriads of microscopic eddies in violent, tiny motion.

He stood erect. The sensation was very slight under his feet, and so constant that he knew he would ignore it soon. He stepped forward, peering ahead at the floor, which seemed to be not quite canted.

He was mistaken, he found when he had moved ten or twelve paces. *Trick of the light.* The floor ahead still seemed to tilt a little, but it was certainly level under his feet. The light—it moved with him!

He stared around him, and saw only the same featureless floor and two walls. It was as if he were

lighted by a spotlight which was concealed from him.

He looked behind him, and just as he turned his head, caught a movement in the corner of his eye. He gasped and leaped to the wall, pressing his back against it, staring into the blackness. There was something—there *was!* A . . . a thing, an *eye!*

It was low down, almost on the floor, and it was moving toward him. Toward him, and then away, and then it stopped, and swayed, and came toward him again, and emerged into the light.

It was a bubble. A big bubble, perhaps fourteen inches in diameter, loosely filled, and apparently it derived its motion from the strange mosaic of miniature maelstroms in the floor. It danced and swayed erratically on them, sometimes turning one way, sometimes another, occasionally rolling a little.

Hulon stepped toward it. If it was alive, it paid him no attention. It moved, but quite aimlessly. As Hulon moved, the light moved with him, brightly illuminating the bubble. He watched it cautiously for a moment, and finally went down on one knee near it. He saw his distorted, dancing reflection in its side. It seemed to be filled with a clear, pale-brown fluid. He put out his hand, screwed up his courage, and touched it. It quivered like jelly but made no effort to escape. He waited until it began to roll again and quickly put his hand on the floor in



front of it. It bumped off his fingers like a toy balloon, and bounced sluggishly up and down until it rested, waiting for the next capricious movement of the floor under it.

Hulon impulsively reached out and picked it up. It sagged in his hands. He pressed it gently—and it burst, leaving him staring ludicrously at his empty hands. There was a great gush of liquid which disappeared immediately when it reached the floor. There was no sign of a skin or bladder of any kind; the thing was simply gone.

Hulon wiped his hands on his tunic and shrugged. The thing was obviously inanimate. It reminded him that he was a little thirsty, but that was all. Thirsty? Perhaps a thing like this would come in handy. He had no idea how long he might be here before— He shrugged again and sniffed at his fingers. The bubble had left a faint, stimulating tang on them. Hulon nodded. If things got bad—

But couldn't this be the death? Poison?

*Wait and see*, he told himself. *First find out what's at the end of the corridor.* And in a flash he knew that that was what he had been hunting for in the back of his mind—the thing about *here* that he must find out. With the knowledge came the realization that only now did he have all his faculties—that from the moment he had found himself stretched out in the corridor, he had been only gradually regaining them.

How had he got here? What

place was this? What was that thought about the two dead men and the dead girl he had talked with? What was the meaning of this fantastic, skimpy garment he was wearing? Where were his clothes? How did the light follow him?

His heart began to thump. He looked at the darkneses, the one which led, the one which followed. Cumulative shock began to take its toll. He turned, turned again, and then stood stock-still, his jaw muscles standing out, his eyes narrowed.

His nerves screamed "*run!*"

He stood still, trembling with the effort. Slowly, then, he went to the right wall and sat at its foot, his back comfortingly against it, his eyes shifting from darkness to darkness; and he began to sort out his thoughts.

"There are thoughts for here," he muttered, "and thoughts for outside—for before I came here." He wet his lips, and consciously relaxed his shoulders, which had begun to ache. "I am Hulon. I work at the Empire Theater, projectionist on the day shift."

He fixed this in his mind, refusing to think of anything else until the thought stood clear and alone.

"Now," he said, speaking softly because the absorbent walls—they seemed to be of the same static-mobile material as the floor—seemed to drink sound the way those darkneses lapped up light, "I will think of *here* first because I am here. Whatever is to happen to me will

happen here, and not at the Empire Theater." Again he waited, fixing the thought on the sturdy walls of his mind until it stopped quivering.

"I don't know where this place is nor who built it. I do know that I'm here to meet death, and to find out what is at the end of the corridor. I know that if I can find out what kind of death I am to meet here, and if I can discover what is at the end of the corridor, I will live forever. If I do not find out these things, I will die here. I agreed to this, and I came of my own accord."

He looked up the corridor, and down. He saw no death. He saw in-leaning walls and a floor illuminated by the pool of light in which he was centered. He saw two bottomless mouths of darkness. And with a start he saw another bubble, wandering aimlessly out of the dark to his left. He grinned at himself, and automatically wiped his hands again on his tunic. As he did so, there was a swift movement on the wall opposite. He tensed, stared. There was nothing there. Trick of the light?

What of the light?

He moved his hands over the brief tunic again, and again saw the blurred motion on the wall.

A shadow!

He lifted the hem of the tunic, turned it up. The light was not coming to the material, but *from* it! It was luminous, through and through. No wonder the light followed him!

Conclusion made and filed. He waited but nothing followed it in his

mind, so he turned his attention to the events *outside* this place. This compartmentation of ideas was the *modus* of his philosophy, and he needed it now as never before. He completely displaced his attention from his current situation and studied the events which had led to it.

The real beginning was when he wrote "Where is Security?" for *Coswell's Magazine*, an obscure quarterly review. But his first knowledge of these strange events was the dead man he saw in the Empire Theater.

Remembering it, he was surprised that he had noticed the man at all. There are, at the best of times, three degrees of work for a theater projectionist—attentive, busy, and frantic. All three are intensified when the theater is running revivals, if it happens that the brittle old film is used, rather than remakes. And that particular night he was stuck with three of them—two features and a short, fresh from a theater where the projectionist apparently didn't believe in splicing film straight across like everybody else, and who cued only two frames instead of four, so that the little flicker of light up at the corner of the screen, which indicated when to change over projectors, was so brief that a man had to have eyes like photocells to see them at all. He missed two of them at one performance, getting a white screen and a gargle from the sound track, and the second time Mr. Shenkman, the manager, came up to

the booth and was nice about it. Hulon hadn't done that in months, and he would have felt very much better about it if Mr. Shenkman had stamped and cussed, but that wasn't the manager's way, and Hulon had no one to be sore at but himself.

He had three viewing windows through which to see the screen—one by each of the big IPC Simplex projectors with their hissing Magnarcs, and one in the splicing room where the film was stored in a steel, asbestos-chimneyed locker. As he moved about the booth, his attention was almost constantly on these windows and the screen. As each reel approached its end he found himself in a near-ecstasy of concentration, trying to determine which, if any, of these spots and speckles was a scratch on the old film or a cue.

It was unthinkable, then, that his attention should have been drawn to anything else through those windows but the screen. But it was. Perhaps the picture itself—an old War I epic starring Conrad Veidt—had something to do with it. Whatever it was, as he leaned close to the glass, his foot ready to stamp the change-over switch by B projector, his eye caught the side-loom of the tobacco-filtered light over the loges directly in front of the booth.

A man sat there, his spine stiff and straight—not unnaturally, but as if this were a characteristic. The light edged a strong cheekbone, a gleaming forehead, and a monocle. There was a slender cigarette-holder—and

then the cue-sign winked on the screen, and Hulon's foot came down. Projector A clattered and Projector B's arc began to hiss, the sprockets began to feed, the shields flipped down for A, up for B, and the change was made. Hulon made a slight adjustment for centering, increased the gain by the duplicated volume control directly under the viewing window. Glancing once again at the screen, he walked around the projector and stared at the line of light which was periscoped up from the arc-case and projected between two black lines on a white card, to show the size of the arc-gap. Satisfied, he opened the lower reel-housing of Projector A and unclipped the used reel. As he did so he glanced again at the screen, and again found himself staring at the man in the loges. He knew that man—he was sure of it. And if that was who he thought it was, that man was dead.

He went into the splicing room and put the reel into the rewinding machine, which started automatically as he closed its cover. Again he glanced out the window, and to his annoyance found that he was not looking at the screen at all, but at the man.

He could have sworn it was Conrad Veidt himself, the famous captain of a score of cinematic U-boats and raiders, the arch type of villainous *Oberleutnant*, the personification of the Prussian martinet.

But Veidt died years ago.

Something touched his shoulder



and he grunted and jumped violently.

"Hey," said Frank, the second-shift man, "what's the matter, Hulon? Seein' ghosts?"

"Revivals are full of 'em," said Hulon. He looked at Frank's grinning, easy-going face and decided not to bother him with his hallucinations. "You'll have your hands full tonight, Frank. Here's the schedule. We're eight minutes behind. I blew two changeovers. You'll have to trim the Coming Attractions rushes a couple feet each, and Mr. Shenkman says it'll be O.K. to leave out the Merchant's Association announcement in the second show. Watch the cues. Whoever marked them has a hole in his head. And you ought to see some of the splicing! I've recut and fixed up a few of 'em and"—he opened the fire-proof locker—"I stuck slips of paper in the reels as some of that sloppy work came through. If you want to make it easier for the next guy, you can go on fixing 'em up."

"Gotcha," said Frank. "What do you keep peering out there for? See a chick in the loges you like?"

"Huh?" said Hulon. "Oh . . . thought I saw someone I knew. You all ready to take over?" The man in the loges was rising.

"That's why I'm here."

Hulon took down his coat. "O.K., chum. Don't let Hollywood go to your head." Conscious of Frank's surprise—for he usually stayed for ten or fifteen minutes to bat the breeze—he whipped open the door

and went down the ladder two rungs at a time.

The man who looked like Conrad Veidt was silhouetted against the screen as he stalked down the center aisle. Hulon hurried after him, following him to and through the lobby. He breezed past Mr. Shenkman with a bare nod and was beside the monocled man as they went through the wide doors to the street.

*I don't want to do this, Hulon thought to himself, but I'll kick myself for the rest of my life if I don't.* He drew up beside the man at the corner and touched his elbow. "I beg your pardon—"

"Yess?" It was the same voice, too—full and precise.

Hulon said: "You're Conrad Veidt." He had meant to say: "You look like—" but the way the man turned, the way his eyebrow arched, were too like what he had seen on the screen to allow any doubt.

"Am I?" said the man, and smiled. "And do you believe in immortality?"

Hulon shuffled his feet. "Well, I . . . I guess not. No, of course not."

The man shrugged. "You know Conrad Veidt is dead. Obviously you are mistaken. Good day."

"'Bye," said Hulon miserably. He watched the man walk away, and stood there feeling very, very foolish.

That was the first dead man, Hulon thought as he crouched against the wall of the strange corridor. Another bubble circled and danced

clumsily near him. He kicked at it; it burst and its fluid disappeared into the floor. Now—who was the second?

Leslie Howard—two days later, under exactly similar circumstances: a Leslie Howard picture, a familiar profile in the loges just before Frank relieved him. He remembered wondering, as he hurried after the figure from the past, down the aisle and through the lobby, whether his attention had been drawn purposely this way, by some mysterious means, or whether it was purely accidental. If it was on purpose, what could be the purpose? What was he, that he should receive such attentions from — He lost the thought in the moment of panic in which he stood in front of the theater, peering, thinking he had lost his man. He saw him, then, at the magazine stand, buying a copy of *Coswell's Magazine*. Hulon stepped up to him. "May I have a word with you?"

The man looked at him, his head very slightly held to one side in Howard's well remembered way. "Certainly, old man."

Hulon wet his lips. He was going to be more cautious this time. "I think you're Leslie Howard."

"The devil you do! Wasn't he killed during the war?"

"So they say."

"Then how could I possibly be?"

"I don't know. I'm not even trying to find that out. Look, whoever you are; please don't think I'm a crackpot. I'm just sort of clutching at straws, I suppose. I've got

some—ideas. I do what I can with them, but far as I can see, it'll take me more than a lifetime to work them all out. When I see someone alive who ought to be dead, something happens to me. I know it must be a resemblance, but in the zillion to one chance that a man might live longer than an average lifetime—much longer, I mean—why, I go hog-wild on it, hunt it out, track it down, just like"—the torrent of words slowed, stopped, and Hulon stood flushing while the other waited politely—"I'm doing with you right now." He laughed uncertainly. "I don't know why I feel I can sound off like this to you."

"I'll take it as a compliment," smiled the other, and clapped him on the shoulder. "But—Leslie Howard was killed, all right. Sorry." And he walked off.

Hulon thought, *No one can know a person's face like a projectionist*. Day after day, hour after hour these faces are drilled into him; nuances of voice and expression emerge that the public never sees, any more than the public sees the flicker of a starting-cue.

The Leslie Howard man paused and said a word to a girl who stood in the doorway of the haberdashery two doors down from the Empire. She nodded and the man went away. She stood still; Hulon went toward her. *I can just walk by and look at her. There's something—*

As he neared her, she turned, and he gasped. That strange, full-lipped

face and spun-aluminum hair . . . they used to call her "The Blonde Bombshell". She was dead too. "Jean Harlow," he choked.

She smiled and put out her hand. "How do you do," she said astonishingly.

He took the hand, his own self-animated to do so. He looked down at the clasped hands as if, at the job, he had found film with triangular sprocket-holes. He looked at her face and blinked. "My name's Hulon—"

"And it's your first name," said the blonde. "I know. Can we go somewhere to talk?"

He noticed under her arm the familiar orange cover of *Coswell's Magazine*—the issue in which his article had appeared. He said: "The Empire Bar has booths."

They went there. *I'll wait*, he thought. *This is crazy; there are too many questions to ask. I'll wait. She knows what she's doing.*

She asked: "How much education have you had, Hulon?"

He helped her with her coat and sat opposite. "Not much. High school. I read some."

"What made you submit to *Coswell's*?"

They use things like that. I thought I had an important idea. It's part of a . . . call it a philosophy, if that doesn't sound too highfalutin'," he said.

"It's a philosophy," she said. "We can call things by their names. What a funny, shy sort of person, you are, Hulon!"

There was nothing to say to this, so he waited. A waiter came and went. Drinks arrived. She tapped the magazine. "What got you interested in the idea of security enough to provoke an article like this?"

"I'm a theater projectionist. I don't follow pictures too closely, but a lot of what they're about sinks in. Seems to me a lot of real-life people are worried about security, too. I began to listen to people I know talk. A lot of them are worried about it. I began to wonder where it was. Everybody thinks it's somewhere else, never where a man can lay his hand to it and say 'Here it is. I have it.' So I figured out where it was, and wrote it down, and *Coswell's* printed it. That's all."

"I read the article. But tell me again—where is security?"

"Behind us." He looked at her expectant face, and expanded the statement. "No use looking into the future for security because the future doesn't belong to us—it's a dream, a bunch of maybes. No use looking in the present for it because the present is, in time, like a mathematical point—a position, without any area. So the only thing a man has is behind him—his memories. The only thing a man can look forward to is looking back at where he's been. What he has means nothing. What he *has had* is the only thing he can hold on to—the only thing that no power on earth can touch. And anybody who tries to run security down will come up against that—possessions that noth-

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ing can touch, things that really belong to a man. So"—he shrugged—"security is not in the future, a sort of mountaintop that people are climbing to. And it isn't in the present, because 'now' covers such a small area in time that it's nonexistent; you can't have security or a cigarette or an automobile in a portion of time so small it can't be measured. It's behind us. It lies only in what we've had and in what we've done."

"That's a startling idea," she said. "It sort of takes away any possibility of self-determination, though, doesn't it? According to your idea, a man can act only in his present, and the present is too short a time to do anything with."

"No it isn't," said Hulon positively. "You can do this much with your present—you can shape the nature of things to form the best possible memory for yourself. You can form the cross section of the passing time-stream as if you were a diamond die, and give it just the cross section that will suit your memory the best."

"And that means that there can be no security for *now*, for this minute?"

"No," Hulon said again. "Security for this minute is a kind of self-confidence that comes from a sort of radar; impulses sent from now, reflecting from things we have been and had and done."

"Good," said the girl. "I'm sorry to be catechizing you like this. I

had to know whether you retain what you set down or whether you were amusing yourself with a passing idea. Now tell me; is this security business your philosophy?"

"Oh no," said Hulon. "It's just part of it. It comes from it."

"Ah. And have you reduced that philosophy to its essentials? Can you say what it is in a few words?"

"Not yet. Not few enough." He pondered for a moment. "I can say this much. And mind you, it isn't as rock-bottom as it will be, but it's as far as I've gone, from watching people, and machines, and from reading and listening to music. It's this:

"What is basic is important.

"What is basic is simple.

"So what is complicated isn't important. It might be interesting or exciting—it might even be necessary to something else that's complicated—but it isn't important."

She nodded. "That's good. That's very good. And—what would you do with an idea like that? Turn the whole world into a gigantic Walden?"

Hulon had not read Thoreau, missed the reference, and said so. When she explained, he said: "Gosh no. I'm no fanatic, wanting to get everybody back to hunting, fishing, and building their own log cabins. All I want to do is to think everything out according to that idea of mine—I mean everything: art and engineering and business and politics. I think I could work it all out, if I had time."



"And then what would you do with it?"

"I'd try to teach it to people—to more and more people, until it got to be a natural way of thinking. The way people let themselves think now just makes trouble. People think if it's bigger it's better. They think if a little is good, a lot has just got to be wonderful. They can see the sense of balance in a diet or in a bridge, but they stop too easily at things like that, and don't try to balance enough other things. Or enough other *kinds* of things," he added, after a pause. "But all that's 'way ahead of me. What bothers me now is that I don't have time to think all this out. I know how big it is, and what a little moment a life is. I could do more with an idea like this if I knew, somehow, that all my thinking wasn't going to get cut off

one fine day by the old man with the scythe."

"And that's really important to you?"

"Really important. Basic," he added, grinning shyly. "So much that if I see someone on the street who ought to be dead, I'll stop and ask him who he is, just in case—just on the crazy chance that someone might've found out how to live longer."

"How do you know anyone could?"

Hulon spread his hands. "I don't. But it could happen. Old age is some kind of a biological mistake. Maybe someone has figured out where the mistake was made. Maybe that was done a long time ago. If it had been done, it wouldn't be the sort of thing you'd advertise in the daily papers. Too many people are afraid of dying. Too many more people want to live so that they can get more and more things, more and more power. People would mob whoever had a treatment like that to sell, and either the wrong people would live long, or the treatment would overpopulate the Earth, and the human race would war itself out of existence for food and space to live."

"You're so right. You have a startling kind of simplicity, Hulon. You drive and drive right to the root of a thing. Suppose there were such a treatment; can you say anything else about the person or persons who might control it?"

Hulon thought for a moment. "I

think so. They would be very careful people. They would have to be able to consider the greatest good for humanity above any race or religious or national lines. They would have to be able to think ahead—years, centuries ahead. They would have to be able to hold their hands, keep from interfering, even when interfering might save thousands of lives. They would have to put pressure here and nudge a little there in quiet ways, so that they would never be found out, and so that humanity would always think it was learning from its own mistakes and nothing else."

"Do you think you are such a person?"

"No!" Hulon said immediately. "But I know I could be if I lived long enough. I think the right way to be that kind of person." The statement was simple and sincere, without braggadocio.

The girl considered him for a long, pensive moment. At last she asked him softly: "If there were immortals on Earth, and if they were all you say, what would be their most urgent need?"

Twice, captured by her eyes, he opened his mouth to speak and closed it again. Finally he said: "Recruits."

She held her gaze on him, unmoving; then she nodded, as if to herself. "How much would you give for a chance to join them?"

"How much have I got? I'd give anything."

"Your life? Would you undertake a test that would kill you if you failed?"

"Of course."

She swirled her drink. "Hulon. Nothing is unique about that philosophy of yours. There is something unusual about your method. You've come a long way on very little material. You think clearly and your motives are clean. That's not much to go on. If you took such a test, the odds would be very much against you."

"Tell me," he asked, wrinkling his brow. "Why would I have to die if I failed?"

"Because you'd know too much."

"I know a great deal now."

"You are having a barroom conversation with a girl you picked up," she said bluntly. "No one would believe a word you might say even if I confirmed it, which of course I wouldn't. But if—and mind you, I'm still talking ifs—if such a situation did exist, and if you did take such a test, fail it, and emerge from it, you might cause trouble. Such a risk cannot be taken."

"That makes sense. Well, when do I start?"

She opened her handbag and took out a lipstick. Unscrewing the cap, she slipped a nail file from under the flap of the purse and inserted it into the cap. She worked it deftly forward and back; it fell into two parts, and a small blue pill rolled into the hollow of her hand. She took Hulon's glass and dropped the tablet in. The liquid began to effervesce vio-



lently. She handed it back. "When the effervescence stops, drink it immediately. All of it."

He took it, held it, waiting, and said: "Are you Jean Harlow?" gravely.

She laughed. "Of course not. You had to seek us out, and you had to do it because you might find one case of extended life, and not for any other reason. You passed that part of it, Hulon. We did it this way because you are a projectionist; you could be expected to notice us particularly. We have other ways, too."

It was the first time she had said "we". His heart began to pound. Abruptly the activity in the glass ceased, completely. "May you live forever," he said, and drank it down.

He could not remember very clearly what happened after that. He saw clearly, he walked steadily, he spoke coherently. There is a linkage between the conscious mind and the memory, through which flows each impression, as noticed, to be stored. And in Hulon, this link was broken, or at least compressed, pinched off, so that any impression, once received, was lost in seconds. He remembered walking, and then a ride—it was a car, but whether a taxi or a private automobile he could not recall—and, after riding for a time which may have been minutes or hours, there was a room with several people in it. The girl was lost somewhere en route; there were other women, but how many or what they looked like was lost to him. There was a man with a stern gray

face who talked with him for a long time, and a room with a wheeled table and pale-green cornerless walls. And there was a time when he repeated and repeated two questions:

*Where is the end of the corridor?*

*What death will I meet there?*

And the gray-faced man, kindly now, wishing him well, reassuring him, making him certain that he would have his reward if he could answer these questions.

And the next thing had been his awakening here in the green-lit dark.

Hulon rose and stepped to the center of the corridor. He paused and listened. Nothing. He drew a deep breath, turned to the right and began to march down the corridor. The skin on his back crawled occasionally, away from the following darkness, and he did what he could to ignore it. He began to count his paces, looking back as he counted each fifteen. Surely nothing would overtake him in the time it took him to walk fifteen paces.

After a few minutes the counting and turning became automatic, and his sense became quite soothed—almost dulled—by the sameness of his surroundings. Occasionally he passed one or two of the bubbles doing their purposeless gavotte on the floor. Once he saw two collide, fuse, burst and disappear.

Where was death?

It would have to be a death from outside himself, he reasoned. Aside from the fact that the featureless

walls and floor gave him nothing to hang himself on, and the complete absence of anything which he might turn on himself, the idea of self-destruction was contrary to the very nature of the test. So, he realized suddenly, was any idea that he might die of hunger or thirst. There was no time limit to his test. Death must present itself to him, or he to it, and that might take days. He must sleep. Would death come to him in his sleep? He shrugged. He could only put off sleep as long as possible and then hope that he would sleep lightly enough to be warned of its approach.

He began to be thirsty. The next bubble he approached took his attention. He stopped and watched it for a moment, then drew a deep breath and picked it up gently. He remembered a story he had read once, called "Goldfish Bowl", in which two men were trapped by super-intelligences, and got their water in globules which were apparently made of just water: when they bit into one they could drink what didn't spill. Hulon was in a mood to forget everything he had ever learned and simply to use what he saw. Accordingly he pressed his face into the bubble and drew it into his mouth. The surface let go and the bubble ceased to be a bubble, pouring down through his fingers. He cupped his hands and managed to gulp heartily, twice, before all the liquid was gone. It had a flavor something like beef extract and something like the water in which asparagus has been cooked,

and he found it delicious. If the fluid had any ill effects, he could not feel them. He wondered for an instant at his own foolhardiness, and then concluded that he must have been told, before he came here, that the bubbles were safe for him.

He began to walk, and the resumption of his attention to the corridor brought sharply to him that something was different. It had happened gradually, and only his transient concentration on his thirst made it possible for him to notice the difference. It was in the light. It had lost its greenish cast and was now pure yellow.

"—Thirteen, fourteen, fifteen," he muttered, and looked behind him. Nothing but advancing darkness. "One, two, three—"

"Uh!"

The wordless syllable was wrenched from him by the glimmer ahead. It was utterly shocking. It was a feature in the featureless triangle. It was a new color in the dichromatic yellow and black. It was a new factor in the lulling sameness of the corridor. And it was a dead man.

He could tell that the man was dead. It was the sparseness of the flesh about the nostrils, the waxen quality of the wrinkled hands folded so meticulously, the statuesque stillness, and, ever so faintly, the smell.

It was the body of an old, old man. It was laid out stiffly, ankles together, hands folded on the thin chest. It wore a garment like Hu-

lon's, but without the luminescence. It glowed, but obviously by reflection, and the color of that reflection made his eyes ache. It was red.

Hulon approached the corpse slowly and looked down at it. Was this the death he was to meet?

No. Death was here, all right, but there was no question in his mind that the death he sought was his own, not that of anyone else. This was someone else who had found it. This was, if he chose to make it so, evidence that death visited this corridor from time to time.

He knelt and put the back of his hand against the still forehead. It was cold. Hulon stood up, stood back. Who had laid out the corpse?

Well, who had put Hulon there? These were pointless questions. He hesitated a moment longer, and then resolutely turned his back on the corpse and strode on. Before him was the same open blackness. Behind him the glimmer of reflected light dwindled, and blackness paced him. "—Twelve, thirteen, fourteen, look back. One, two, three—"

The light was changing again. When had the pure yellow taken on that orange cast?

He determined not to think. He would watch ahead and behind. He would notice the light. He would drink when he was thirsty and, if he must, he would sleep. If he were to deduce the nature of the death that was here, he wanted more evidence. If he were to find what was at the end of the corridor, he must

walk to it. Meanwhile he would not think.

The orange color was deepening, somehow—reddening. He watched as he walked, walked, turned, walked, walked, turned. And at about the moment he recognized it as a yellowless red, a true red, he saw another gleam of light ahead. He was not sure how much later this was—two hours, three—he knew only that he had been walking a long time.

He slowed his pace and approached the glimmer cautiously. Last time it had been a corpse. This time—

He grunted. This time it was a corpse, too. An old man, and again he sensed death. This one was worse to look on than the other. It, too, wore a short tunic, glowing with reflected light which, insanely, was not the same color as the light which struck it. It was pure blue. That was not the horrible thing, though. What horrified Hulon was the pose of the corpse.

It was not neatly laid out like the other. It was tumbled rudely on the floor, not quite in the middle of the corridor, as if it had been thrown there. The tunic was up around its chest and one arm was crumpled underneath in a way impossible unless it had been broken.

For years Hulon had felt that the flesh, once dead, was of little importance, and had regarded the rituals of burial and the somber traditions of *de mortuis nil nisi bonum* mere carry-overs of barbarism. In



spite of this he found himself filled with horror and pity at the sight of this poor tumbled thing. He knelt by it, turned it on its back. An eye stared. He closed it gently, gently folded the hands and straightened the legs, and smoothed the tunic.

He stood up, feeling, somehow, better than he had. "You take it easy now, feller," he said. "'Bye now." He began to walk, walk, turn again. At the first look back the corpse was a corpse; at the second, a dim blue. At the third there was only the respectful, persistent, stalking darkness. After that, only the unchanging, hypnotic triangle in which he walked between shadows.

In due time his tunic was violet, and when he saw the third dead man, the one in yellow, his tunic had turned blue.

The yellow-clad corpse was harder for him to see, somehow. Perhaps it was weariness, perhaps it was the undefining blue which streamed around him, but it took him some moments to discover, as he rolled and pulled the corpse, straightening it out, that it, too, had a broken arm. This one was heaped and tossed, worse even than the last one had been.

He stood over the body, after he had finished, and tried to think. A bubble wandered drunkenly over to him and began to nudge the dead man. Hulon kicked it so hard he hurt his knee. It splashed its liquid all over the corpse's face and neck.

"Sorry," said Hulon abjectly. He turned away and began plodding

down the corridor, counting aloud. "—Nine, ten, eleven—" By the third time he got to "fifteen" and looked back, the darkness had swallowed up the third corpse.

It was a long time later when he came on the next rumped, disordered corpse. He did not touch this one. He moved close enough so that his light—yellow now, after an interminable shift through the greens—would immediately fall on the fourth corpse. It was dressed in red, and had an unnatural arm. Hulon breathed slowly, deeply, through flared nostrils. His eyes were dull and he ached with weariness, and the soles of his feet tingled infuriatingly from their constant contact with the strange irresolute surface of the floor.

*If I could sleep for a while,* he thought desperately.

A bubble pirouetted into the wall, bounced. He went to it and picked it up in widespread hands. This time he was careful and drank deeply of it. He shook his hands and wiped them on his tunic, and sat down by the wall to rest, and to think if he could. The taste of the bubble-liquid was good in his throat. He could feel strength pouring back into his abused tissues. The light seemed to grow brighter, though he knew that it was his clearing eyes that caused it. He pulled his feet in and rested his chin on his knees, and at last thought returned to him.

*Four old dead men.* He fixed his mind on this and let everything else

disappear from his mind. Then he took them in order.

The first was dressed in red, the second in blue, the third, yellow—and the fourth was red again. There was something about these colors that niggled at him. It wasn't the specific colors; it was the order in which they appeared. There was some sort of regimentation to the colors he had seen.

He put the thought of the dead men's clothes aside, because, at the moment, he could go no further with it. He closed his eyes and concentrated. The color of his own garment—yellow-green when he awoke here; pure yellow when he found the first corpse; then yellow-orange; orange; orange-red; pure red. The word "primaries" occurred to him. He caught it and held it. *Yellow is to red as red is to blue as—* He shook himself violently. Either he was near something important or he was delirious.

He looked at the corpse. An unremarkable old man, except for his age, which was extreme. What mad system was behind this business of corpses with broken arms? What point was proved, what evidence given, by a collection of ancient and similar cadavers which were somehow associated with the primary colors and broken arms and—and what else was it? Oh yes; they were huddled, dumped out on the floor. Except for the first one, of course.

Colors. A luminous garment—he racked his brains now—which changed from yellow-green to yel-

low, orange, red, violet, blue, green, and yellow again. Spectral.

The light had been yellow when he saw the corpse in red; red when he saw the corpse in blue; and—yes, and blue when he saw the corpse in yellow. And the one he looked at now was the same as the first: the light was yellow and the corpse was dressed in red.

Same as the first! The idea smote him—and he immediately discarded it. There are some things one may not doubt. If this were the same corpse over again, then one of two things was happening: the corpse was being shifted—snatched from the corridor behind him and rushed up and dumped ahead, and being changed in the meantime, to boot—or this corridor was circular. The first hypothesis was ridiculous in terms of the test he was undergoing; the people who controlled were certainly not going to indulge in fantastic and harmless complications just to annoy him pointlessly. The second—that the corridor was circular—could be believed only if he disbelieved everything his sense of balance and direction and orientation told him. He *knew* he had been walking on a level surface, and in a straight line. Every sense involved told him he had.

And yet—

He crawled to the corpse and knelt beside it. It was very like the one before. And the broken arm, and—suddenly he remembered the vicious kick he had given that bubble, and

how it had splashed on the last corpse—or was it the last but one? He couldn't remember, and it wasn't important. He sniffed at his fingers. The refreshing, meaty odor of the bubble-liquid was still on his hands from the last time he had drunk. He bent low over the corpse's still, twisted face.

Unmistakably, the odor was there.

He scrambled back to the wall and huddled there. He clung to a single conviction, that whatever was here, whether he could understand it or not, was here by design, for a specific purpose which involved him. And he knew now, beyond the slightest doubt, that the colors had confused him utterly. It had taken him four encounters to realize it, and he was almost certain that he could expect no more "evidence". Now, of all times, was the occasion for him to apply the philosophical analysis of which he had been so proud. It seemed a paltry tool indeed.

Could this corridor be circular?

It seemed impossible. Even though he had walked a long way between corpses, he was sure he would have been conscious of the arc. One or another of the walls would have continually crowded him.

With a conscious effort he opened his imaginative faculty. He had read fantasies in which antigravity and gravity-controlling devices had been used. Suppose his corridor really was circular—but vertically, like an automobile tire? And suppose, at its hub, was an artificial gravity device. Would he not then

walk in a straight line, turning neither to right nor left, and then come back to his starting point? Such a fantastic device would have to compensate for the Earth constant, of course, but if he could imagine a gravity generator, a gravity insulator was no problem.

He opened his mouth to shout his conclusion—and checked himself. *Wait.* This was only a hypothesis, and it did not answer the two questions. It made ridiculous the first one: "What is at the end of the corridor?" and did not answer the second at all: "What death will you meet there?"

No: He must think of something which covered everything—the shape and size of the corridor, the changing colors, the nutrient bubbles, the corpses. *The corpse.*

He stared at the body of the old, old man. "You could tell me—" he muttered. "*Think—think!*"

The corridor couldn't be circular; it just *couldn't*. And yet, if there were some way— If he could only . . . only— He snapped his fingers. All he had to do was mark the wall or the floor, and walk! If he could come back upon the mark again—

"Mark it how?" he asked himself aloud. This crazy surface wouldn't take a mark. Moisture disappeared on it. The corpse stayed on it; he himself stayed on it, but the resilient surface couldn't be scratched, wouldn't stain.

Use the corpse as a mark, then. But—he couldn't trust it. He found it tumbled about, and wearing a dif-



ferent tunic each time.

The answer occurred to him. It had undoubtedly been in his mind for minutes, but he could not face it. For a time he crouched there not thinking at all. Gradually, then, he let the terrifying thought emerge. He began to tremble.

He looked at the beckoning blacknesses. He clenched his fists and made a sobbing sound. He rose then, and carefully bent to the corpse, straightening the light old limbs, crossing the hands on the chest, smoothing the scarlet tunic. "Don't go away," he murmured.

He peeled his own belt apart and slipped the shining yellow garment off. Kneeling, he tucked it under the belt the corpse wore, tightening it down until there could be no chance of its coming free by itself. Then naked and terribly alone, he strode into the darkness.

The shadows folded themselves happily about him. He looked back. The golden radiance from his tunic poured upward from the red-clad corpse. And there was something wrong about the floor on which it lay.

He moved closer to the right wall, trailing his fingers lightly along it to guide him as he walked into deeper blackness. He looked back again. What he saw made him clutch convulsively at the leaning wall, in a sudden attack of vertigo.

The corpse, as clear and distant as something spotlighted on a stage, was just as he had left it. But be-

tween him and the corpse, the floor seemed to have bellied downward, and twisted as well, so that the dead man lay as if on a slanted deck. The slant seemed almost enough to make the body roll, though it did not.

Hulon moved sidewise along the wall, away from the dimming light. The floor where the corpse was seemed to be canting more and more as he moved, and the floor between him and the body seemed to fall downward away from the corpse and up again to him. And in a few minutes the distant picture apparently rotated up and out of his sight, and he moved steadily forward into an unthinkable dark.

It must have been a half hour later when he began to whimper. He was hardly aware of it at first. He ground his teeth and walked. His inner conviction was that he had analyzed his situation correctly, and that there was, therefore, nothing to fear. But if he were wrong—what might be lurking in this blackness? What horror might spring at him to rip and tear his soft unprotected flesh, or slide slimily over him, throwing fold after fold of cold wet coils about him?

He heard his own soft whimpering and stopped it abruptly. *You are alone here*, he told himself fervently. *There is nothing to fear.* He stopped, slid down to the floor, huddled up in a foetal posture, to rest. In the quiet, in a blackness so complete that he could see the ruddy flashes of his own pulse, he forced his mind to be still.

Something cold touched his bare hip. He writhed away and screamed, knowing in the same instant that it was one of the bubbles. His heart thumped so hard that he was panicked, suddenly, lest it make so much noise that he could not hear the approach of . . . of— *But I'm alone here*, he scoffed.

He fumbled for the bubble, touched it, lifted it and drank quickly. The highly nutrient solution soothed him in and out as he drank and spilled. He rested a moment more and then rose, stretched. *Soon I should see light*, he thought as he walked. *And if I am right, the light should be red, and the old man will be dressed in . . . in—* Aloud he began to chant softly as he walked, "Violet, blue, green, yellow, orange, red, violet, blue, green—"

Before him, so dimly that it could easily have been a trick over his hypersensitive, straining eyes, he began to see a loom of light. He quickened his pace. Soon, now, he would know.

His whole body strained toward the light, and he became increasingly conscious of the deeper darkness behind him. Almost hysterically he blanked out the ancestral fears which crowded at his bare back and shoulders, which increased as he increased his speed.

And now it was unmistakably light, and the light was red! Hulon laughed, and began to run. He could see the walls now, and again could know the shape of the corridor.



Again he saw the floor sweeping down and away from him and then up to the hidden light-source. When the source finally burst upon his vision, he grunted and threw his arm over his eyes. He slowed to a panting walk, and slitted his lids, until he could see again.

He saw a tumbled corpse, and it was dressed in blue. Red light and a blue tunic, and he was right! He was right!

He sprinted toward the spraddled, dead figure which, distantly, seemed to be clinging to the wall—a wall which leaned and twisted and joined the leaning and twisting floor under his feet. This gave him no more vertigo, for now he understood it, and his vision was no longer in conflict with the sense of balance and orientation which told him with all the authority of thirty years of refined experience that the floor was level and flat.

He pounded up to the corpse, which was, when he reached it, lying on the level floor on which he stood. He grinned at it. "Thanks, fella," he chuckled. He took the luminous red tunic and slipped it out of the blue belt of the garment the corpse wore. He slipped it over his head and fastened it. Then he filled his lungs and shouted.

"Come get me! I have the answers!"

His voice was lapped up greedily in the echoless place. Stiffly he waited. Then, shockingly, the light went out.

Hulon stood stiffly in the total dark. *I've shot my bolt*, he thought defiantly. *There can't be any other answer.*

Barely to be heard over his tense breathing, there was a small, steady hiss. An acrid mist swirled into his nostrils. He tried not to breathe, but it made him gasp, and when he did that there was a loud singing in his ears and he fell heavily, quite conscious, quite unable to move.

The hiss ceased. Silence. Then the hum of a suction fan. The acrid smell disappeared. He lay limply, half on his side, for minutes.

A blaze of yellow light hurt his eyes. Somewhere the wall had opened. There were people around him. A girl—the same one he had spoken with first, but her hair was chestnut now. And the gray-faced man, who asked: "Can you hear me, Hulon?"

"Yes," said Hulon clearly.

"You're ready to give the answers?"

"Yes."

The man knelt beside him. "The vapor you just breathed will kill you in two minutes," he said calmly. "I have a hypodermic here which can keep that from happening. After I give you that—if I do—you will die within two hours. There is a further treatment, of course. It's the one you came here for. It will kill you within . . . oh, say twelve or fourteen hundred years if it isn't renewed. Now: give me the answers, and if they are correct, you'll get the hypo.



Give me your reasoning and if that's acceptable you get the final treatment. Do you understand? You will die now, or in two hours, or not at all."

"I understand," said Hulon steadily. It was odd, being able to speak but not to move.

"What is at the end of the corridor?"

"I am," said Hulon. "It—has no end."

"What death was waiting for you?"

Hulon said carefully, "Aside from anything you might do to me, there was only one kind of death here, as long as it was warm and I was fed. Old age."

The hypodermic bit into his shoulder. "Oh, good boy, good boy!" said the girl.

They helped him up when he said his legs were beginning to tingle, and turned him toward an irregular opening in one wall. He noticed that the surface of the wall seemed violently agitated at the edges of the doorway. He was half carried into a short tunnel with a steel door at the other end. This door swung open at their approach, and they stepped down into what appeared to be a comfortably furnished doctor's office. Hulon was put into an easy-chair near the desk. The gray-faced man sat on the swivel-chair and the girl perched on the edge of the desk. She smiled at him, and he smiled back.

"Look," said the man, pointing to a box on his desk. It looked like a

small speaker. He flipped a switch on its side. "This is a microphone. There are a lot of people listening. If they like what they hear, you're in. There's a green light and a red light—see? I don't have to explain that much further, eh? Except to tell you that all votes are integrated and it'll take a two-thirds majority to make either light come on. Shall we go ahead?"

"I have something less than two hours," said Hulon wryly. "P'raps we'd better."

The doctor grinned. "Right. Just tell it in your own way; what you figured out about that corridor, and how."

"Well," said Hulon carefully, "the easiest thing to figure out was that it was endless—that is, it turned back on itself in some way. I figured that it had some sort of gravity mechanism under the floor. That right?"

The girl nodded. "How did you think of that?"

"That was the only way it could have worked. It didn't appear to curve to right or left. And at first I guessed that it was a vertical circle, like an automobile tire. But that idea fell down after I tied my tunic to the dead man and walked away from it, and saw the way the corridor twisted. The color of the light was the real tip-off. As I moved through the corridor, it went right around the spectrum. Every time I ran into the corpse, I found that his clothes were a different color—and his colors changed around the spectrum, too. When I was a kid in

school we learned the colors by their initials: V, B, G, Y, O, R. Well, if you consider those as six 'points' on the band, you'll see that the color of the dead man's clothes were always two 'points' behind. On top of that, I saw that every time I bumped into the dead man I was one third of the way through the spectrum. So I had three 'thirds' to put together: I met the corpse a third of the way through the spectrum—the corpse's clothes were a third of the spectrum behind the color of mine—and the triangular cross section of the corridor. There's only one explanation that fits all these things, along with the fact that that poor old fellow was tumbled all over himself each time I came on him. And it's sort of . . . hard to describe."

"Try," said the doctor.

"Well," said Hulon, "a while back my relief at the theater, Frank, showed me something that kept me tickled for hours. He'd read about it in a magazine or somewhere. He took a strip of scrap film about eighteen inches long and put the ends together. He turned one end over and spliced 'em. Now, if you trace that strip, or mark it with a grease pencil, right up the center, you find that the doggone thing only has one side!"

The doctor nodded, and the girl said: "A Möbius strip."

"That what they call it?" said Hulon. "Well, I figured this corridor must be something like that. On that strip, a single continuous line

touched both sides. All I had to do was figure out an object built so that a continuous line would cover all three of three sides, and I'd have it. So I sat down and thought it out.

"If you take a piece of clay and make a long . . . uh . . . sausage out of it, and then form it so it has a triangular cross section; and then if you bring the ends together and rotate one one hundred twenty degrees and stick 'em together, you'd have a figure like that. It would have only one side, like the . . . what was it? . . . Möbius strip."

"Nice reasoning," said the doctor. "You're quite right. Incidentally, it would have only one edge, too."

"It would? I never thought of that. Anyway, I visualized a figure like that, and then imagined one that was hollow, and myself inside it. Now, as for the light, my guess is that it moved through the spectrum one third of the way each time I went around the circle, and all the way through the spectrum when I'd been around three times—that is, when I reached the place where the same 'wall' was a floor again. I think the walls of the corridor were a floor, one after the other, I mean."

"That's pretty clear. The corridor is what a topologist calls a non-simply-connected continuous trifacial. Now, what's your guess about gravity?"

"I can only say *what* was done," said Hulon, frowning, "not *how*. But it seems to me that the whole corridor was somehow insulated from Earth's gravity, and that my

feet in some way controlled an artificial gravity in the place. In other words, wherever I walked was 'down'. And that effect only worked lengthwise along any side that was a 'floor' at the moment. I mean, if I had turned and tried walking up the wall, it wouldn't have worked, even though that wall did become a floor later, when I came on it endwise. That's what tumbled the dead man around like that every time I got him laid out. He'd lie nice and still until a wall beside him became a floor, and the floor on which he lay became a wall. Then he'd simply fall away on to what was now a floor."

"Good!" said the doctor heartily. "And have you any idea why you always found him dressed in a different color?"

"Not really. Unless it was just a characteristic of the material to reflect yellow in blue light, red in yellow light, and blue in red light. I don't know how that could be, but I don't know how controlled gravity could be either."

"All right! You're doing fine. One more question, and we'll have the vote. Why do you suppose we set up the test just the way we did?"

"Why I . . . I imagine so you could test about everything there is to test in a man," said Hulon. "To see if he can analyze things he observes—even things that are against all his previous experience."

"That's right," smiled the doctor. "Including how badly he can be scared, and still think straight." He

bent to the speaker. "Vote," he said shortly.

There was a tense pause, and then the green light flickered, went out, lit—and stayed alight.

The doctor clapped his hands together delightedly, and the girl skipped down from the desk and kissed Hulon's cheek.

"You're in, boy," said the doctor. "You are right all down the line. Antigravity is something we've had for a long time. The surfaces in the corridor are coated with a substance that is in superficial molecular motion; we used it because it can't be marked. Your tunic is treated with a substance that fluoresces right through the spectrum, excited by ultra-high-frequency radio waves. And the dead man—not a real one, by the way—had a tunic treated to do just what you guessed—it reflects light a third of the spectrum away from the color of the light-source. You'll learn all about these things in time." He rose. "Let's get to it."

Hulon rose with him. He felt wonderful. "And then what?"

"Then you'll go right back to your job, like the rest of us. You'll spend a lot of time with your new 'steady,' of course, and once in a while you'll attend a meeting. But by and large, things will be the same."

"'Steady'?" asked Hulon.

The girl said "Me," and gave him a smile that made his head swim.

"Now this," said Hulon, "I am going to like!"

THE END



# FINISHED

BY L. SPRAGUE De CAMP

*Most men are finished when they're dead. It's a very unusual thing—or very unusual circumstances—that can bring his people knowledge and advancement when he's been dead for years!*

Illustrated by Cartier

"It won't work forever," said Abreu gloomily. "Keep up a technological blockade, and at the same time allow communication between Krishnans and beings from other planets? Bah! Why doesn't the Interplanetary Council ask us something easy, like lighting the Sadabao Sea with a match?"

Comandante Silva, who had come over from his planet for the conference, looked amused. "We have no trouble on Vishnu, and moreover we run the station without red tape. Your forms, Senhor Cristôvão, are getting notorious—"

Abreu turned pink and began to bounce in his chair. "Easy for you to criticize, Senhor Augusto. You know Bembom's a little station compared to Novorecife, and that your Vishnuvans are simple-minded children compared to Krishnans."

"I only said your red tape was getting notorious, which—"

"But I tell you—"

"Which it is—"

"Queira, senhores," interrupted Kennedy. As for the Comandante of Novorecife was the S. O. P., the others subsided. "Let's not get personal. We all do the best we can with what we have."

"Well, it still won't work," grumped Abreu. "Some day they'll get something big through, and then we'll learn whether the I. C. is right in fearing that the backward Krishnans might start an interplanetary war once they have their scientific revolution."

Silva said: "I sympathize with you, at that. The I. C. is just a board, and a board may be defined as a long, narrow, and wooden thing. I've been writing them for a Vishnuvan year now to get—"

"Yes?" said Abreu. Gorchakov, the head customs inspector, had come in.

"You'd better be in on this, *chefe*," said Gorchakov. "You know that Earthman we cleared for travel a few ten-nights back—Akelawi? Ahmad Akelawi?"

"The tall Algerian engineer? *Sim*. What about him?"

"He's trying to take a mummy through customs."

"Excuse me, *senhores*," said Abreu. "I certainly do want to be in on this." The head security officer of Novorecife heaved his bulk out of his chair and waddled after Gorchakov.

"What sort of mummy?" he asked.

"Some native king. He claims it's perfectly legal, and has a bill of sale to show for it."

Abreu prepared to bristle at the sight of Akelawi. Being short and fat, he suspected all tall men of evil

designs, and the Algerian was perhaps the tallest man ever to set foot on this outpost of the *Viagens Interplanetarias*. Akelawi still wore his Krishnan makeup: antennae, green hair, and artificial points to his ears. He gazed down at Abreu from large dark eyes with an expression of melancholy reserve.

Abreu brusquely asked: "What's this all about, Senhor Ahmad?"

Akelawi sighed. "First I explain to the customs inspector, then to the head customs inspector, now to you, and I suppose after you to Comandante Kennedy—"

"Never mind that, my good sir. Just answer the question."

"Very well. As I've already said twice, I bought this mummy from Prince Ferrian of Sotaspé. Here's my bill of sale, with the prince's own signature."



"Why did you buy it?"

"To take to Earth as a museum piece. Even with the present freight rates it'll pay the cost of my trip."

"Whose mummy is it?" asked Abreu, bending over the object. "*Mãe do Deus*, it's ugly!"

Akelawi said: "It's supposed to be the remains of Manzariyé, the first and only king of Sotaspé."

"How so? Have they a republic, or what?"

"Not exactly. They have a legal fiction whereby King Manzariyé is still the legal ruler, and the reigning prince has only the status of a regent. The reasons are very complicated and legalistic—"

"Never mind them, then. Have you X-rayed it, *amigo*?"

"Not yet," said Gorchakov. "I thought you'd want to be present—"

Half an hour later Abreu completed his examination. "I don't see why we shouldn't let you take it through," he told Akelawi. "But tell me: Why should Prince Ferrian sell the sacred relic of his ancestor?"

Akelawi shrugged his bony shoulders. "He didn't say. Perhaps he plans to make himself king in name as well as in fact."

"I see. What's that medal you're wearing?"

"The open glider-championship of Mikardand. If you'll let me start signing that mountain of papers, maybe I'll be through in time to catch the ship."

He signed out and departed with his mummy.

Three days later, after Akelawi had taken off on the *Lorêto*, a slim burning-eyed young Krishnan stormed into Novorecife. His clothing was that of a rich islander from the Sadabao Sea, and his Brazilo-Portuguese was, if not broken, at least badly bent.

"I am Prince Ferrian of Sotaspé!" he shouted at the amazed Abreu. "What have you filthy animals done with our sublime king?"

"You mean that mummy Akelawi took with him?" asked Abreu.

"To you mummy, perhaps, but to us, sacred symbol of our eternal kingdom! Where is?"

Abreu explained.

"You mean," cried the prince, "that symbol of glory of our ancestors has gone millions miles away? That this thief, may Dupulán rot his intestines, has—"

"Wait a minute, my good sir," said Abreu. "Are you claiming that Akelawi stole this mummy, and didn't buy it from you as he said?"

"Of course he stole! Think you we such poor things as sell our very king?"

Abreu told his secretary: "Get the photostat of Akelawi's bill of sale out of the files. If there's been a mistake, Dom Ferrian, we'll set it right. Here you are. Isn't that your signature?"

"Looks like, but I never signed no such paper. He must have got it by trick. When does next spaceship leave for Earth?"

"In nine or ten days. But, my friend, you know there are dif-



ficulties to getting permission for Krishnans to travel on *Viagens* vehicles—"

"As if we were not oldest and proudest line in universe!" said Ferrian hotly. "Let me tell you, senhor, some day will be end to this discrimination—"

"Now, now, it's not a matter of thinking ourselves superior to the Krishnans. It's a question of your cultural fitness to absorb scientific knowledge. When you've adopted modern ideas on government and legal codes—"

Ferrian told Abreu, in guttural Gozashtandou, what to do with his legal codes.

Abreu, keeping a tight grip on his none-too-amiabile temper, replied: "Why not let us handle it? The *Viagens* security organization can send a dispatch to Earth by the next ship. As soon as the message is received, the great Earthly police forces will go into action and have your king back here in no time."

"What is no time?"

"Oh . . . Krishnan time, about nine years. It takes that long for the message to reach Earth and the king to return."

"No! Can't wait. Must go myself. You think I let my poor ancestor be jerked all over universe without escort, lonesome, unprotected? You Earthlings don't know nothing about respect due divine rulers."

"Very well. File your application in due form."

Thus it happened that the next

spaceship for the planets of Sol's system bore Ferrian bad-Arjanaq, Prince Regent of Sotaspé. Since the space-traveler was, on one hand, a person of importance, while on the other he was still a native of a backward planet whose warlike people were not allowed access to technical information, Abreu sent his assistant security officer, the small and modest Herculeu Castanhoso, along as guardian.

When Abreu saw them off, they were arguing hotly about the Fitzgerald effect. Ferrian refused to believe that if it took a hundred-odd days, subjective time, to get to Earth, something like fifteen hundred days, objective time, would have meanwhile elapsed on Krishna.

"We have fairy tale," he said scornfully, "about the miner Ghala-djúh who go to Fairyland and spend three days, and when he come back all his friends have grow old. But you don't expect me, adult and educated man, to take that sort of thing serious!"

Years passed.

There was a scandal about the introduction of the custom of kissing into Krishna. In the resulting shakeup Abreu was transferred to Ganesha, though it hadn't been his fault at all. Then a similar shakeup, when the tobacco-habit spread to Krishna in the administration of his successor, brought him back again, thanks to Earthly geriatrics not visibly older.

Then one day the fast new

*Maranhão* settled down on the Novorecife landing area, and down the ramp trudged Castanhoso and Prince Ferrian.

"Well!" said Abreu, shaking hands vigorously. "I thought you two should be showing up soon. Did you get your mummy?"

"Yes," said Ferrian, in much improved Portuguese; "it was a most interesting journey, even though this guard of yours kept me confined like an aqebat in a cage. He'd let me read nothing, even, save a moldy old law book he picked up somewhere."

"Those were his orders," said Abreu. "When Krishna achieves the interplanetary standards of law, ethics, and government, then maybe we'll let you have access—"

Ferrian made an impatient motion. "Save your lectures, my friend. Right now I'm more interested in arranging transportation to Madjbur for myself and my king. While the trip didn't seem so long to me, the wait will have been interminable for my poor wives. I must see them again."

Abreu, a henpecked man, envied the prince his ability to manage not merely one wife but a whole platoon of them. However, like a wise bureaucrat, he kept his reflections to himself. When Ferrian was out of earshot he asked Castanhoso:

"How did you make out, Herculeu?"

"Not badly. He obeyed orders all right; the only trouble is he's too intelligent."

"How so?"

"He draws correct inferences from the least things. And he can turn on charm enough to lure a fish out of a pond when he wants to! I finally gave him that law book to keep him quiet, thinking that Krishna could use some modern law."

"You did right. Did you know you'd been promoted?"

"Why . . . uh . . . thanks, but isn't there a mistake? I've just *been* promoted—"

"You forget, my boy, that was by subjective time, while for pay and seniority purposes, service is figured by objective time—"

Abreu saw to it that the prince and his mummy departed in a twenty-oar barge down the Pichidé River, then returned to his paperwork and put the kinglet out of his mind.

Until he got a letter from Gorbovast, the resident commissioner of King Eqrar of Gozashtand in the free city of Madjbur. Gorbovast, in addition to representing King Eqrar, picked up a little change on the side by spying for Abreu. The missive read:

From the writer to the distinguished addressee, greeting:

O worthy one, a matter of interest to you has come to my notice. As you know, the Prince of Sotaspé has resided here for a ten-night or more, having with him the mummy of King Manzariyé. Today there docked here a vessel flying the banner of Sotaspé, carrying the Sotaspéo prime minister, Sir Qarao bad-Avé. 'Tis said a

tame bidjar flew a message to Sotaspé for this ship to come fetch the prince.

The matter of most interest, however, is the ship *Kerukchi* herself. For the means of propulsion on which she relies, besides sails, are not oars but a mechanical device. To either beam is affixed a great wheel having paddles of wood set about its rim so as to dip into the water as the wheel turns. The wheels are revolved by a machine within the hull, whose details I cannot give you because the Sotaspéva let none aboard their craft. 'Tis said, however, that the machine works by boiling water, and that smoke issues from a tall pipe amidships.

As the *Kerukchi* will probably sail soon, when the machine has been readied for the voyage, you must hasten if you'd view this craft. My respectful regards to you and yours.

Abreu, after reading the letter through again, buzzed furiously for Castanhoso.

"Herculeu!" he shouted. "Make an appointment with the barber for both of us! We're going out! Green hair and all the rest!"

Meanwhile in Madjbur Prince Ferrian was giving his prime minister a proper dressing-down.

"You utter, unmitigated idiot!" he cried. "Has Sotaspé no ships of the conventional kind, that you must even bring the *Kerukchi* hither, where rumors of its being will surely reach the Ertsuma at Novorecife? Take that, fool!" He slashed at the minister's head with an aya-whip.

Sir Qarao ducked, prostrated himself, and beat his head on the floor. "Have mercy, your sublimity!" he wailed. "You know I could never manage your harem!"

"What about my harem?"

"Why, this ill-starred venture was undertaken upon the insistence of your wife the Lady Tánzi, who said she sought to do you proper honor by sending the pride of our navy to fetch you!"

"Pride! Honor! *Ghuvoí* such talk! My wife the Lady Tánzi wished to score one over my wife the Lady Kurahi, did she not? Why sought you not the counsel of my wife the Lady Dja'li?"

"I did, but she's ill, and referred me to your wife the Lady Rrovrai, who took the part of the Lady Tánzi—"

"I see," snarled Ferrian. "A proper muddle. Well, at least this error shall not be repeated, for when I return to Sotaspé there shall be a new law in the land. A law book I read while among the Ertsuma convinced me of its desirability."

"What's that?" said Qarao, raising his head from the floor.

"Compulsory monogamy, as among the Gozashtanduma."

"Oh, but your sublimity, what will you do with all your faithful wives?"

"Faithful, ha! I can imagine, after all these years— But to answer your question, I'll divorce all but one and pension them off. If they can find other husbands, let 'em. They'll have little trouble, since they'll have wealth and prestige and we have a surplus of men."

"Which will you keep, godlike sir?"

"That I hadn't decided. The



Lady Dja'li's the most sensible, but she's old; the Lady Dunbeni's the most beautiful, but she's cold; while the Lady Tánzi's the most loving, but lacks the wit the gods gave an unha—"

Two days later Abreu and his assistant stood before Gorbovast in Madjbur. Gone were the trim *Via-gens* security-force uniforms. To all appearances the Earthmen were a pair of raffish-looking Krishnans in divided kilts, stocking caps, and cutlery.

"Right sorry am I, sirs," said King Eqrar's commissioner. "The *Kerukchi* departed at dawn, as I warned you she might, taking Prince Ferrian and his moldering mummy with her."

"That can't be helped," said Abreu in his fluent, accentless Gozashtandou. "What I need is a fast ship to catch them."

"There be some large merchantmen in harbor—"

"Scows! Too slow for a stern chase."

"Are you planning—"

"Never mind what I'm planning! Whatever happens, it'll be on the high seas where it's every man for himself. The only law that can touch me will be Sotaspéo law, and I don't intend to come under that jurisdiction. Where can I get a galley?"

Gorbovast raised his antennae. "Madjbur Town will hardly rent out the ships of their navy."

"How about the King of Zamba?"

"No. He has no wish to become embroiled with Sotaspé."

"And anyway it would take too long to arrange," said Abreu. "Think, man, think!"

"I think," said Gorbovast. "*Ohé!* How about Captain Zardekú and his *Alashtir*?"

"What's that?"

"A tern bireme which Zardekú bought from Arisang last year and converted to a fast merchantman. He has eighty stout rowers pulling forty oars, and a good spread of sail, and can outrun aught hereabouts save Madjbur's great quinquireme *Junsar*."

"How on Krishna can he make a profit with eighty rowers to feed? They eat like bishtars. And there can't be much cargo space."

"Ah, but 'tis for a special purpose! With the *Alashtir* he trades in the Van'andao Sea, in defiance of the monopoly claimed by Dur. Should any normal merchantman venture into those waters, the Duruma would catch him ere he'd gone ten hoda and throw his folk to the fish. Zardekú, however, dashes in and out and wiggles his tongue at 'em, for they can catch him no more than King Gedik could catch the rain god in his net. Methinks some of the goods he brings to Madjbur were obtained by plain piracy, though there's no proof of that. At all events, he was still here yesterday; why seek you not him?"

Captain Zardekú turned out to be a tall heavy Krishnan lolling on a

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bench in a waterfront dive with an air of sleepy good nature. Somebody had once flattened his flat Krishnan nose still further with a blunt instrument. He said:

"For the terms ye mention, gentlemen, I'd take the *Alashtir* over the waterfall that legend used to place at the other end of the Sadabao Sea, where the water poured over the edge of the world. When would ye set forth?"

"This afternoon?" said Abreu.

"Nay, not quite so fast as that! 'Twill take me till the morrow to drag my sturdy boys from those entertainments that sailors seek ashore, and to get supplies aboard. If ye would, though, I'll cast off an hour ere dawn."

"Agreed," said Abreu. "I hope your men are willing to spend nights at sea."

"Aye, they'll do it if I so tell 'em. They've had to sleep on their benches ere this, when the Duro galleys were crawling on our track like the bugs from under a flat stone. And for a chase of this kind I'd better embark some supplementary rowers."

Captain Zardekú, almost as good as his word, cast off half a Krishnan hour before sunrise. The forty oars, two men to an oar, thumped in their locks as the prevailing westerlies carried them down the estuary and out into the Sadabao Sea. To the west, to landward, great piles of clouds swept in stately ranks across the greenish sky, but as they reached the shoreline they dissolved

into nothing, so that the seaward half of the dome of heaven was clear.

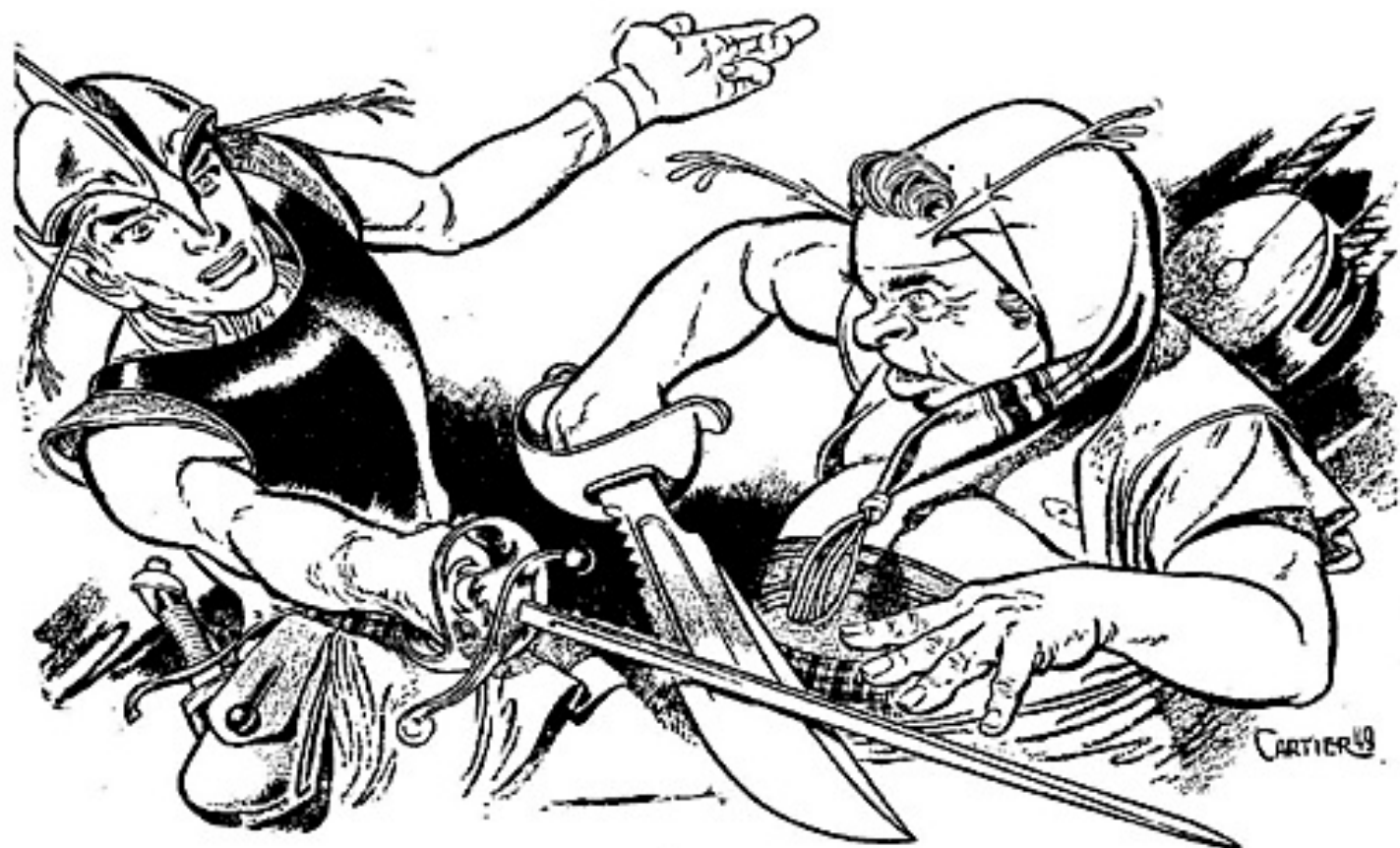
The wind filled the three triangular lateen sails. "'Tis a new rig in these parts," said Zardekú. "For fast maneuver a tern has it all over a two-sticker, and can sail closer to the wind, for ye can control the ends of your ship with the small sails. However, it looks as if our chase would be all running free, if this breeze holds. Would ye put in to Zamba?"

Abreu made the negative head-motion. "He's not likely to have stopped there, after such a short run from Madjbur, unless the machinery broke down. We might sail a reach past the Reshr harbor, just to make sure he's not lying there, and go on to Djérud."

"One point to port!" said Zardekú, and went on to talk of piracy and nautical lore and ship design; how the shipwrights, before they found the trick of putting two or more men on the same oar, used to range the oars in several tiers, with all sorts of elaborate arrangements to keep the rowers out of each others' hair—

Although there was no sign of the *Kerukchi* in the harbor of Reshr, the harbor master at Djérud told them: "Yes, we saw this craft go past with a long stream of smoke blowing ahead of her. Thinking she was afire, we sent a galley out to help, and sore foolish they felt when the fire-ship signaled that all was well."





Captain Zardekú topped off his supplies of food and water for the gigantic hunger and thirst of his rowers, and set out again over the emerald waters. They stopped at Zá, where the folk have tails like those of the Koloft Swamp; and at Ulvanagh, where Dezful the gold-plated pirate reigned before his singular demise.

On the fourth day the *Alashtir* came in sight of Darya, where the folk wear coats of grease in lieu of clothes. They recognized the island by its two rocky peaks long before the rest of it came in sight.

The lookout called down: "Smoke in the harbor, but I see not what it means."

"Captain," said Abreu, "I think our man stopped here for wood and

is just about to pull out. Hadn't you better rig your catapult and give the rowers a rest?"

"Aye-aye. You there!" Zardekú began giving orders in his usual mild tone, but little above the conversational. Abreu, however, noted that the crew hopped to it nevertheless.

While the rowers loafed and the ship eased towards the harbor under sail, the sailors brought up a mass of timbers and rope from below, which they assembled on the foredeck into a catapult. They piled beside it the missiles, which could be called either feathered javelins or oversized arrows.

"What now?" asked Zardekú.

"Heave to; we can't go into the harbor to take him."

Zardekú brought his ship's bow

up-wind and let go his main sheet so that the big mainsail flapped, while the small fore and mizzen sails, as close-hauled as they could be braced, kept just enough way on the *Alashtir* to prevent her from drifting shorewards. The swells smacked obliquely againts her bow, giving her an uneasy rotary motion.

Through a telescope Abreu could see the paddle-wheel steamer, her stack puffing angrily. They must be stoking her up, he thought. As the *Alashtir* worked slowly past the harbor, a quarter-hoda away, he got a view of his quarry from several angles. Another conversion job, evidently; he could see the places where the outriggers for the oarlocks had been attached when she had been a galley.

"Aren't we getting too far north?" he asked Zardekú. "If she heads south when she comes out we might have trouble catching her."

"Right ye be," said Zardekú. "Haul the main sheet! Let her fall off a point!"

As the ship gathered speed, Abreu asked: "Captain, why are we sailing directly away from the harbor?"

"To get sea-room to wear ship."

"But why can't you simply turn to the left?"

"Port helm and back sails? Think ye I'm mad? Y'only do that when 'tis a matter of dodging rocks!"

Abreu, realizing that he was no sailor, left the technical end of the art to Zardekú.

"The fire ship's coming out!" called the lookout.

"Better hurry, captain," said Abreu.

Zardekú gave more orders. The rowers ran out their oars. The helmsman swung the ship hard to starboard until the bow pointed toward shore, while the sailors let out the sheets until all three sails were flapping. The rowers backed, holding the ship immobile, the swells smashing against the stern.

"Have to see which way he turns," said Zardekú. Then, after a minute: "He's bearing south. Let go the luff braces; haul the leech braces; haul the sheets, starboard the helm!"

The high ends of the yards came down as the low ends rose. After much running about and hauling on ropes the ship shook herself out on the other reach and headed towards the *Kerukchi*, which had come out of harbor against the wind on her paddles alone and was now shaking out her sails. The *Alashtir's* rowers grunted as they dug in their oars.

The two ships sailed on converging courses until Castanhoso said: "They seem to be running up flags. What are they saying?"

Zardekú put eye to telescope. "Interrogatory. In other words, have we any business with them? Qorvé, run up 'heave to'. Hain, load the catapult."

The *Kerukchi*, instead of stopping, continued on her way, running up more flags. Abreu supposed that

the proud prince was telling them what he thought of them.

Zardekú said: "They have a catapult, too. On the poop."

The wind hissed through the rigging. Presently a thump came from the *Kerukchi*, and a shower of specks rose from her poop and arced towards the *Alashtir*. They plunked into the water before they reached the other ship.

"Bullets," said Zardekú. "I like that not; my rowers'll suffer." He put his megaphone to his mouth and roared: "Heave to, miserable *baghanna*! We wish to parley!"

"What would you?" came back the answer.

"Tell him his ship," said Abreu.

"Your ship!"

"Go to Hishkak!" came the thin voice across the water, and there was another thump. This time a shower of lead balls over a kilo in weight bounced against the *Alashtir's* woodwork. There were yells from the benches, and Abreu saw one rower sprawled on the deck with his head mashed. A couple of relief rowers dragged him out of the way, and one took his place. Other men were laying weapons alongside the benches.

The *Alashtir's* own catapult whanged, sending a javelin over the *Kerukchi's* stern. The catapult crew of the steamship ducked and scattered, to be bullied back to their weapon by the officer commanding the squad.

Abreu said: "Captain, if you can get further forward, they won't be

able to reach us with that catapult because their rigging will be in the way."

"But then they could reach us with their ram," said Zardekú. "We have no ram; I took it off when I converted the ship." After a few seconds he added: "Besides, they seem to be gaining on us."

Although Zardekú called encouragement to his rowers, who responded with mighty grunts and visibly bent their oars, the stack of the *Kerukchi* was now smoking furiously. The spray kicked up by the wheels hid most of the stern of the ship, which began to inch ahead of the *Alashtir*. *Thump!* The lead balls flew high, making several holes in the sails. *Whang!* A javelin stuck in the *Kerukchi's* planking.

"If you can hit one of those wheels," said Abreu, "as I told you—"

*Zizz!* Abreu ducked as a couple of crossbow-bolts flew over his head. Up forward one of their sailors was down, and others were shooting back.

Zardekú went forward to oversee the catapult himself, trotting along the catwalk over the rowers' heads. The *Kerukchi* continued to forge ahead.

*Whang!* The javelin flew between the spokes of the *Kerukchi's* nigh paddle-wheel and buried its head in the planking behind. The wheel stopped with a groan, wedged fast, the shaft of the missile sticking out at an angle. The *Alashtir* seemed to



jump ahead as the *Kerukchi* slowed, since her sails could not do much against the drag of the stationary paddles.

"Surrender!" came the voice of Zardekú through the megaphone.

A voice from the *Kerukchi* told him what to do to himself.

Zardekú persisted: "We'll board ye! Come, we would not murder ye all!"

More obscenities.

"Lay aboard," said Zardekú. "Grapnels out! Boarders muster!"

"Come, Herculeu," said Abreu, hefting a cutlass. "Take one. We must lead the charge, you know."

"Uk," said little Castanhoso, looking anything but Herculean. Nevertheless he put on his helmet with shaky fingers and joined the gang in the bows. The inboard man of each pair of rowers had armed himself and gone forward, leaving his mate to manage the oar. The boarders crouched behind the protection of the wales as more arrows and quarrels whizzed overhead. Meter by meter the hulls of the ships approached each other.

"Gangplanks out!" said Zardekú.

The sailors threw out several gangplanks with spikes on the far ends to hold them fast in the foe's woodwork.

"Boarders away!" said Zardekú.

Abreu, although he considered himself a little old for such lethal athletics, felt he must set an example for his subordinate. With astonishing agility he jumped up and ran across the nearest gangplank.

The thunder of feet on the planks behind him told him that the rest of the boarders were with him.

At the far end of the gangplank a man was trying to pry the spikes out of the planking. Abreu cut at him, hit something, and kept on without waiting to see what damage he'd done. Yells and tramlings; clang of steel.

Abreu found himself facing a slim elegant figure in a skimpy suit of light armor, oxidized black and inlaid with gold, who handled a straight sword like a professional duelist. Behind the nasal of the helmet Abreu recognized Prince Ferrian.

"Give up?" he said.

"Never!" The prince danced at him in one of those fancy fencing lunges.

Abreu caught the prince's point on his buckler and whacked at his opponent. No fencer he, and anyway there was no time for fancy stuff. Others pressed by on either side of him. The prince, blood on his face, thrust wickedly at each of them, his blade flickering out like lightning, but there were too many. Suddenly he was holding the stump of a broken rapier. As he dropped it and stepped back to the rail, feeling at his belt for another weapon, a pike took him in the chest and shoved him over the side. *Splash!*

"All over," said Zardekú, sheathing his sword. The outnumbered Sotaspéva had already fallen to their knees before they had either inflicted or suffered much damage. Castan-

hoso was obviously torn between pride in the drop of blood on his blade and concern for the well-being of the surrendered sailor whose arm he'd nicked.

"Who's the head man?" demanded Abreu. "You?"

"If it please your p-pirateship," said Qarao. "What is all this?"

"Where's the mummy?"

"In the cabin, sir. May I show you—?"

"Lead on." Abreu followed the minister to the cabin below the poop. "Ah!"

The mortal remains of King Manzariyé were no prettier than they had been on the previous occasion.

"What do you?" cried Qarao in sudden anguish. "Sacrilege!"

"Bunk!" snorted Abreu, slitting open the mummy with his dagger along the carefully sewn seam in the king's flank. "Look here!"

"Who be ye?" cried Qarao. "Men of Dur, or disguised Earthmen, or what?"

Ignoring the question, the security officer pried open the mummy and fished out a fistful of small books. "Look, Herculeu," he said. "Chemistry, structures, heat-engineering, electronics, calculus, strength of materials, aeronautics— He did a good job. Now, *you!*" He glared at the cringing Qarao. "Would you like to answer questions, or join your lamented master in the sea?"

"I . . . I'll answer, good my lord."

"Good. Who built this ship? I mean, who converted it to a steamship?"

"Ahmad Akelawi, sir."

"And Ferrian and he fixed up a scheme to take the mummy to Earth, stuff it full of technical literature, and bring it back to Krishna, yes?"

"Yes, sir."

"What did Akelawi get out of it?"

"Oh, his sublimity had figured out a complicated scheme for converting some of his ancestral treasure into Earthly dollars. Also he was going to make Akelawi his Minister of Science, if Akelawi ever got back to Sotaspé."

"I see," said Abreu. "He's an original, this prince of yours; I'm sorry he's drowned."

"Do we arrest this one?" said Castanhoso in Portuguese. "We could take the mummy along for evidence."

"Hm-m-m," said Abreu. "It occurs to me that we made a serious mistake in letting the mummy back into Krishna without examining it more thoroughly, didn't we?"

"*Pois sim.*"

Abreu mused: "And if we arrest this man, and so forth, that fact will come out. The results might be bad for the service, not to mention us."

"Yes sir."

"If we drag Qarao back to Novorecife on charges of conspiracy to violate I. C. Regulation 368, Section 4, subsection 26, the native Krishnan states will make a terrible howl about illegal arrest, and we'll be called murderers and imperialists and all

sorts of hard names. Whereas if we let this one and his men go with a warning, and burn the ship, the matter will be ended to the satisfaction of all. Since the unfortunate prince is now fish-food, and we'll be on the watch for Akelawi, there'll be no more violation of the technological blockade from this source."

"True," said Castanhoso, "but I hate to burn this handsome ship. It seems wicked to destroy knowledge."

"I know," snapped Abreu, "but we have a policy to carry out. The peace of the universe is more important." He turned to Qarao and spoke in Gozashtandou: "We've decided that this conspiracy was not your fault, since you merely carried out your master's orders. Therefore, as soon as we've cleaned up and burned the ship—"

"*Iyá!* Generous masters, pray do not burn the pride of the Sotaspéo navy—" and Qarao began to shed big tears.

"Sorry, my good sir, but it must be. Zardekú, collect your men."

Meanwhile Ferrian bad-Arjanaq, Prince of Sotaspé, clung to the lowest paddle of the port wheel with only his head out of water. He could not be seen from the deck of the *Kerukchi* because the other paddles and the wheel structure were in the way. He had thrown off his helmet and was worming his way between duckings out of his mail coat. After much straining exertion he got the thing off. It sank silently.

Now at least he could swim.

Although he could hear voices on deck, he could not make out the words over the sounds of wind and water, especially since the larger waves ducked him from time to time. A couple of loud splashes told him that the fatal casualties of the fight were being disposed of. More tramping and voices, and sounds of things being broken up and moved about.

Then a crackling that he could not at first identify. It took him some minutes to realize that the smell of wood smoke which normally clung to the *Kerukchi* was much stronger than could be accounted for by stoking up the engine. When he realized that his prize ship was actually burning, he cursed by all the gods of his pantheon and added a salt tear or two to the Sadabao Sea.

Well, he couldn't hold this paddle all day. Presumably the other ship would push off from the *Kerukchi's* side and stand off a safe distance to windward to make sure her prey was fully consumed. Nor would the *Kerukchi* simply burn down to the water and then lie sloshing, a waterlogged hulk, as would most ships. The weight of the machinery would take her to the bottom.

Prince Ferrian wormed out of his remaining clothes and struck out for shore, keeping the blazing *Kerukchi* between him and the *Alashtir*. The fresh afternoon breeze blew a long streamer of smoke down over him, making him cough and swallow water but also helping to hide him.

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The customs of Darya being what they were, he could go ashore as he was without fearing arrest for impropriety.

A ten-night later the merchantman *Star of Djasmurian* docked at Sotaspé, and Prince Ferrian, followed by two men carrying a large box, came ashore. Those who saw him almost fell over with astonishment.

"Your serenity!" babbled a man. "We all thought you dead! Your cousin Prince Savarun is about to declare your eldest son Prince Regent—"

"We'll soon fix that, my good fel-

low," said Ferrian. "Get me an aya somewhere! I'm for the palace."

After the excitement had died down, Prince Ferrian made a speech.

"First," he said, "my thanks to my dutiful subjects who have kept the kingdom running so faithfully in my absence. How many rulers could go away for years and return to find their thrones still their own?"

"Second, you know that we've suffered a grievous loss. Our sacred relic, our king, is no more. However, I had a replica made of wood in Darya, which will be used in place of the true king. I got the idea from a law book I read while among the Ertsuma.

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"Third, polygamy is hereby abolished. While I appreciate the devotion my wives have given me these many years, there are sound reasons against the institution. I might mention that petty jealousy among my wives caused my great design to fail. (No, no, Tánzi, stop your weeping. You'll be taken care of.)

"Fourth, since my plan for industrializing Sotaspé has failed, I've been forced to find a substitute. Why, thought I, should we strain every nerve to steal the secrets of Ertsum science? Why not develop our own? While reading that book on the history of Earthly law I learned of a system whereby the Ertsuma have long promoted knowledge and invention on their own planet. 'Tis called a patent system, and as soon as the Privy Council can work out the details, Sotaspé shall have one too."

Abreu, wearing the slightly smug air which success always conferred upon him, reported to Comandante Kennedy on the outcome of his foray into the Sadabao Sea. He ended:

"Far be it from me to brag, Senhor William, but thanks to the efforts of the good Herculeu and myself, the most dangerous threat in years against the technological blockade is now over, smashed, finished!"

And a few ten-nights later Prince Ferrian, who loved speech-making and public appearances, stood at the

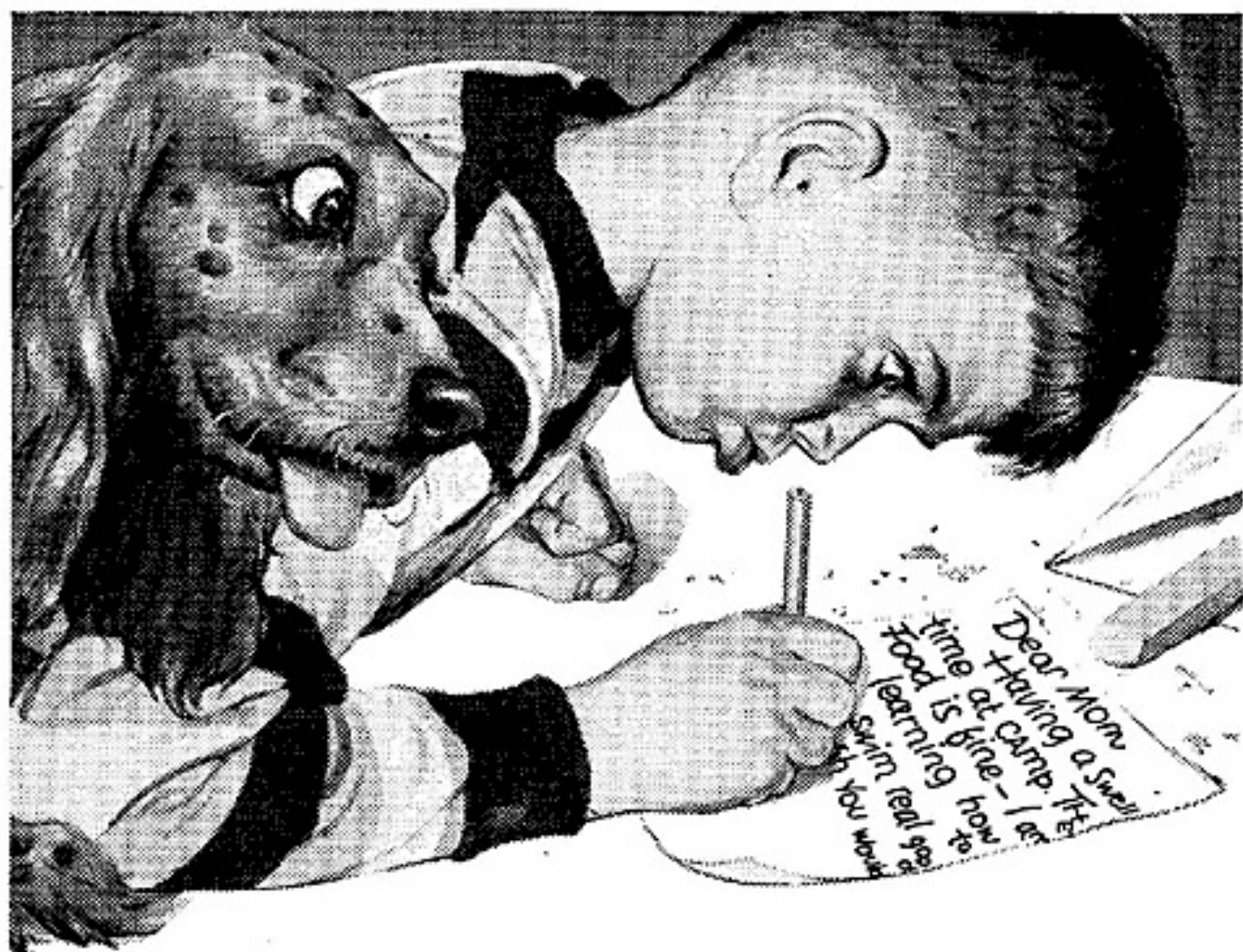
head of the great flight of marble steps in front of Coronation Hall. Before him knelt a shabby little Sotaspéu with his arm in a sling. Ferrian, in stentorian tones, read a proclamation:

"... ur subject Laiján the carriage-maker has combined the glider wherewith the mainland sportsmen amuse themselves by soaring through the air with the fireworks wherewith we celebrate astrological conjunctions, to create a new and useful device, to wit: a rocket-powered flying-machine with which one can fly like an aqebat whither one wishes. Although the range of the device be yet short, and its control be yet imperfect—as you see from Master Laiján's broken arm—these difficulties shall be overcome in time.

"Therefore I, Ferrian bad-Arjanaq, Prince of the Realm, do confer upon you, Laiján bad-Zagh, Patent Number 37 of the Sotaspéu patent system, together with the rank of knight in recognition of the outstanding quality of the invention."

He touched the kneeling man with his sceptre. "Rise, Sir Laiján." He hung a medal around the little man's neck. "And now," he finished, "let a full holiday be declared, with feasting and fireworks. Henceforth this day shall be known as Liberation Day, for this day the walls of ignorance in which the tyrannical Ertsuma have long sought to imprison us are overthrown, blasted, *finished!*"

THE END



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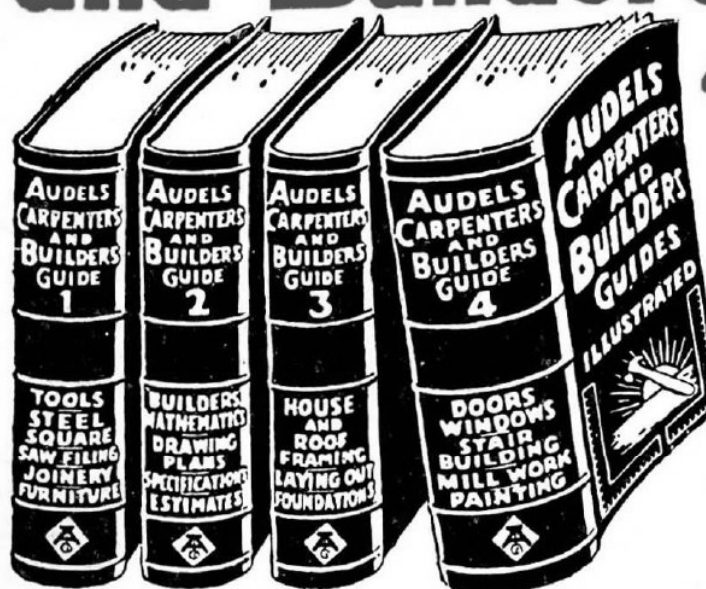


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